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JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 9 JANUARY, 1934 Number 1

Relation of the Number of Medical Graduates to the Public Need*

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Everyone recognizes that the question of an adequate supply of properly trained physicians for the country as a whole and for individual sections of the population includes a wide range of variables. Some of these can be estimated with reasonable accuracy, while others are unpredictable; some are controllable; others are not. It is, therefore, very difficult to draw any accurate conclusions regarding this whole question.

There seems to be a general impression that there is an oversupply of physicians in this country at the present moment, but the problem of excess personnel is not confined to the medical profession, as witnessed by the large unemployment in every walk of life, in a number of which there has been an absolute, as well as a relative, decrease in opportunities for employment because of the mechanization of industry, farming, transportation and other fields of endeavor. Nor is the phenomenon peculiar to the present time, for at different periods of history serious consideration was given and even legislative action was utilized to curb the number of physicians.

It is highly important that a reasonable balance between the supply of physicians and the needs of medical care should be established. If there are too few physicians the medical needs can not be met adequately and the cost to the individual is likely to be elevated. There will be dangers of a serious shortage of personnel in case of a national emergency, because physicians cannot be trained properly in a few months. In the event of an inadequate number of doctors, there is likely to be a lowering of standards of training in order to overcome the insufficiency. If there are too many physicians, the quality of medical care is likely to suffer from economic pressure, the total cost is likely to increase through the creation of unnecessary services, and bad practices are likely to arise, particularly among the less well trained physicians, which, in turn, lowers the morale

*Read at the Forty-fourth Annual Meeting of the Association of American Medical Colleges, held in Rochester and Minneapolis, Minn., October 30, 31 and November 1, 1933.

of the whole profession. Of great importance, also, is the fact that when conditions within the profession become unsatisfactory, there is a definite influence on the quality and type of students who desire to study medicine.

The logical approach to the question is to ascertain, if possible, the approximate number of physicians needed to provide an adequate medical service for the country and for emergencies. At once, we are confronted with differences of opinion as to what an adequate service shall comprise and the extent to which physicians are willing and able to integrate and direct the professional and economic program of medical care. It is widely recognized that many persons are now unable to secure adequate medical care because the necessary facilities are not available in their community, the individuals are not able to pay for the services required, the physician is not fully abreast of current knowledge and skill in certain phases of diagnosis and treatment, or because of other factors.

While it seems quite evident that we have an excess number of medical personnel in the country as a whole, it is well known that many physicians now in practice obtained their training before many of the scientific facts governing sound practice were known and before educational facilities for their dissemination were as well developed as they are now, even granting that there still is much room for improvement in this regard. The problem is not merely one of numbers but it involves the far more vital question of an adequate number of properly qualified practitioners. Of these there probably is a real shortage. It appears equally clear that the medical personnel is not fully effective because of the lack of proper integration and organization of efforts, unsatisfactory provisions for financing these services, both for the physician and the patient, and incomplete organization of continuation education of physicians which aims to keep every doctor familiar with up-to-date methods in the diagnosis, care and treatment of patients, a factor of medical care from the standpoint of the patient and the public which is extremely important.

In certain respects there is no longer the need for the high ratio of physicians to the population which was required in the past. The increased density of the population, the great improvement in transportation and communication, the development of better facilities for medical service in many areas, the influences of preventive medicine, and the training of nurses, technicians and other aides who are able to do some of the work which the physician needs to have done, all tend to make it possible for a fewer number of physicians to do a greater amount of more satisfactory work for a larger number of people.

The distribution of physicians is also quite faulty. It is well known that a large proportion of recent graduates locate in the cities where the economic conditions have been more satisfactory, where there are better

professional opportunities, and where there is more likelihood of professional and public recognition. The emphasis in medical education and the marked changes in rural life have also been important factors. Recognition must be given to the fact that the needs vary widely in different sections of the country on account of climate, the age and race composition of the population, and the extent to which public health and preventive medicine are developed.

If we look for aid in this problem to the situation in the older countries of Europe where the population and profession are more stabilized than in this country, our comparisons must immeditely take into consideration the great differences in economic, social, geographic, climatic, educational and other factors, as well as the differences in the standards of living, in the extent to which the population looks to the government to provide education, transportation, health and other services, and in the wide differences in the demands made by the public. With these and other qualifications in mind, we find that in Great Britain and France there is one physician to about 1,500 of the population; in Germany, one to about 1,200; in Norway, one to 1,600; in Sweden, one to 2,600; compared to one to about 785 in this country. If we include the nonmedical practitioners in this country who are licensed to practice the healing art (of which there are about 35,000), the ratio is one practitioner to about 640 of the population.

It is quite likely that the proportion of the medical profession in most countries of Central Europe who devote themselves to medical practice is smaller than it is in this country, partly because of the more general employment of medically trained persons in activities other than practice. In Southern Europe, as in South America, many individuals study medicine and later do not practice. There is a good deal of discussion in Germany and France about the oversupply of physicians in those countries, but it does not necessarily follow that adequate medical care is being provided for the entire population, even in the presence of an alleged excess number of doctors. If, however, we can assume that there are enough physicians to provide a reasonably adequate medical service for those countries, it would suggest that we probably have an excess number of physicians in this country, after due allowances are made for the different factors which need to be considered in such general comparisons.

Such a conclusion, however, should not be made on the basis of comparisons or on the basis of curtailing the number of doctors in this country in order to improve their economic opportunities. Our concern should be with the ways and means of improving the quality of medical care and of medical education for the benefit of the entire population in every section of the country.

It is generally admitted that there is a wide gap between our present knowledge regarding the diagnosis, treatment and prevention of disease and the extent to which that knowledge is actually available and utilized. The natural inference would be that there are many opportunities to narrow that gap and to increase considerably the medical service to be rendered to the people, and, as a corollary, that there be an increased utilization of physicians. Perhaps, a great many opportunities would result from an extension of our present services. This would apply in a number of fields, such as individual preventive medicine, hospital administration, laboratories, industrial medicine, school health services, organized public health programs and other fields. This may not mean an actual increase in the number of physicians needed, for many of them are not fully employed at present, but the total amount of medical services would be increased appreciably.

A more effective use of the present numbers would probably permit us to provide adequate medical services without increasing the number of doctors. The use of a wide variety of subsidiary non-medical personnel which can be used satisfactorily in doing certain services under medical supervision is increasing. Among these are laboratory, x-ray and physical-therapy technicians; home, hospital and public health nurses; social service workers; midwives; office help; interns and residents; and the personnel of health departments. The numbers of some of these groups are indicated roughly as follows:

Nurses	350,000
Office help	30,000
Health Department personnel	12,000
Midwives	50,000
Optometrists	20,000
Physical therapists	3,500

At present, the physicians represent between 10 and 12 per cent of the total personnel dealing with individual community health problems. The utilization of these workers in the various forms of organized practice makes it possible for the individual physician to direct and be responsible for the care of a larger number of patients than if he endeavors to carry on many of these functions himself, although there are many who believe that some of the services now performed by non-medical helpers should be performed only by physicians.

Although generalizations must be guarded, experience in a number of instances has shown that it is possible to provide a reasonably adequate medical service on the basis of one active physician to from 1,000 to 1,200 persons, depending on the area, the population group, the method of organization and numerous other factors. While such isolated instances

cannot be taken as a basis for the whole country without various reservations, that ratio would indicate a need of about 120,000 physicians, compared with the 156,000 physicians we now have, but of whom, however, about 20,000 are over 65 years of age.

It is, perhaps, well to review briefly a few historical data regarding the production of physicians in this country. In 1904, there were 28,142 students in the 160 medical schools, and 5,747 graduates. In 1920, the number of schools had been reduced to 85 and the number of students to 13,798. In 1922, the 81 medical schools had 2,520 graduates, the lowest number in recent years. In 1933, the student enrollment in 77 schools was 22,466 and the 68 four year schools graduated 4,895 students in that year.

At the present time the approved medical schools of the country are graduating approximately 4,900 medical students per year. This is likely to be a little higher in the next few years because of the higher percentage of matriculants who graduate. If 80 per cent of the first year students graduate, we shall be producing slightly over 5,000 doctors per year within a few years. In addition, more than 200 persons are licensed annually to practice medicine without having graduated from an approved medical school. There are, also, about 250 added each year to the profession from schools outside of the United States, which makes a total of about 5,400 added annually to the profession in this country, without regard to other practitioners of the healing art.

During the last decade, the average number of deaths of physicians yearly has been in the neighborhood of 3,100. This would indicate that there is a net increase of more than 2,000 physicians each year. It is to be expected, of course, that there will be a higher death rate of physicians in the future for the mean age has been increasing, as shown in tables 1 and 2:

TABLE 1.
Physicians 65 Years of Age and Over.

1900	8.2 per cent
1925	12.1 per cent
(Predicted for) 1960	18.6 per cent

TABLE 2.
Physicians over 45 Years of Age.

1900	38.6 per cent
1925	61.4 per cent

The Commission on Medical Education endeavored, on the basis of actuarial studies, to predict the future supply of physicians in the United States[1], giving due consideration to a number of variables.

No attempt was made to predict what the annual additions to the profession will be, but figures were obtained on the basis of yearly additions of 4,800, 5,000, 5,200, 5,400 and 5,600, beginning practice at 26, 27 and 28 years of age. The annual additions to the profession, plus those members of the present profession who still survive at each ten year period, give the total number of physicians for each decade. The total number of doc-

1. Final Report of Commission on Medical Education, 1932, Chapter III.

tors under each of the conditions was then divided into the estimated population of the country for the same dates. The results give the probable population per physician under the several conditions given for each of the periods. For example, if the additions to the professions continue to be 5,400 per year and the average age which individuals begin their medical practice is 28 years, there will be 183,100 physicians, a ratio of one physician to 750 of the population, in 1950. If the number of additions to the profession is higher than 5,400 per year, we can expect the ratio to drop to one physician to fewer than 700 of the populaion.

The concern of this Association and the universities is with medical education and we should place emphasis on endeavoring to improve the training of physicians and students. It is likely that some of our medical schools are now endeavoring to educate a larger number of students than can be trained in the light of our present concept of what a proper preparation should be. For this reason, the number of students in some of the schools could be reduced.

A few schools find it difficult to provide an adequate standard of medical education at the present time because of the lack of financial, laboratory and clinical resources. Some of these schools might well be discontinued. Any suggestion of reducing the number of students or medical schools, however, must be made in the face of an overwhelming number of applicants. Any endeavor to reduce the number of students studying medicine will probably lead to agitation for the creation of new schools and will almost certainly lead to increased pressure on the state university schools.

There is urgent need in every section of the country for institutions under educational control which are willing and able to devote themselves to graduate studies of various kinds. Probably no phase of professional education is as important at the moment as this, which promises during the next twenty years to undergo rapid and widespread developments. It may be profitable and wise to transfer the functions of some of the present medical schools into graduate schools, although this cannot be done on the ground of economy. Any general plan for the serious training of specialists will not only be of the highest public service, but will incidentally keep considerable numbers of younger physicians from beginning practice immediately after their internships. That some plan for the proper training of specialists and for the continuation education of physicians in practice will have to be worked out seems evident to everyone. When such a plan is in operation, a considerable number of doctors will be under instruction at all times and out of active practice for varying periods. This will tend to reduce the number of active practitioners at any moment and at the same time improve the quality of medical care everywhere.

Even among the schools which maintain high standards, the insistence on a high level of performance will result in the elimination of weaker students. Nothing will be gained by such a procedure, however, if students dropped from one school are permitted to repeat courses or to continue in other institutions.

It is highly important that the graduates of foreign medical schools be required to meet the best standards in this country. The strict enforcement of these requirements by the state medical boards would probably keep down the number of graduates of foreign medical schools from entering practice in this country.

Every effort should be made to advise colleges and universities of the country and the student bodies of these institutions regarding the present situation in the profession and in the medical schools. It does not seem likely that the number of students applying for admission to the medical schools will be materially reduced because of the fact that there are three times as many students in the colleges and universities of the country today as there were in all the secondary schools of the country in 1890. The enrollment in the colleges and universities has increased seven times and in secondary schools fifteen times as rapidly as the population during the period between 1890 and 1930. This situation in regard to applications for admission to medical schools, is only a part of the much larger educational problem.

Efforts should be made to increase the opportunities and positions for those with medical training, not only in the fields of prerate practice but also in administrative work; public health positions; teaching, college and school health services; laboratories; x-ray departments; hospital administration; and in a large number of other positions for which a medical training qualifies the individual better to perform the functions of the position in question. Efforts should also be continued and extended in the direction of the education of the public to demand and to pay for more satisfactory preventive as well as curative medical services. A large proportion of the population need periodic medical examinations and individual health advice. An attempt to provide such important services for the entire public will greatly increase the demands made on the medical profession.

It would obviously be unwise to propose a reduction in the number of physicians without at the same time suggesting and developing methods of providing a more satisfactory and more complete medical service for the people of the country. It would be difficult to justify a reduction in the number of physicians in the face of unsatisfactory and inadequate medical care, the faulty distribution of physicians, hospitals, public health activities, laboratories, nursing and dental services, and the widespread lack of facili-

ties for graduate medicine. Our responsibility and our opportunity are in devising and promoting plans to correct these serious defects by raising the quality of medical education, not the length of it, improving the hospital internships, developing facilities for the proper training of specialists, enforcing high standards for medical licensure, developing proper types of graduate education, and accepting the challenge of devising sound, comprehensive programs of medical service which will meet the needs of each community. If we do these things, we shall be able to utilize fully the talents and energies of all the qualified physicians we have and can train.

II.

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It is taken for granted that others will have shown you the way in which the number of graduates in medicine is related to the number of physicians in practice, and will have submitted a formula by which you may compute the number of physicians needed to render adequate medical care in any given community. It is also assumed that the application of this formula has demonstrated a considerable surplus over and above the needs of the country, and that you have been convinced that such overcrowding of the profession must necessarily work serious injury, to the entire population. These trivial matters being thus easily disposed of, you are invited to consider with me, briefly, what, if anything, can be done about it.

Under the form of government to which we have been accustomed, the regulation of medical practice is a function of the several states which is exercised for the public good. In theory, the states could, in the interest of the general welfare, limit the number of persons licensed to practice medicine. This has been done in Sweden. It is inconceivable that it could be done in the United States. Our people cling so tenaciously to the dogma of equality that such laws would be unenforcable even as our present laws purporting to set up educational standards for the practice of medicine are unenforceable. In every state of the Union, and the District of Columbia, the medical practice act is undermined by laws admitting osteopaths on a lower educational standard, and in all but half a dozen states it is to all intents nullified by the recognition of chiropractors and drugless healers. So long as this is the temper of our people, it is vain to hope that the number of practitioners will be regulated by the state.

In fact, there are those who question whether the professions should be limited numerically. There are some who deny that the door to a pro-

fessional career should be closed to anyone who aspires to enter. It is argued that no one can determine who should or who should not become a lawyer, or a doctor; that the only reliable test is the test of experience; that individuals with natural aptitude and thorough training will succeed while those less fit will be forced through failure into other vocations. Let it be granted that no process of selection can be perfect, and that mistakes must inevitably be made. It is still true, especially in medicine, that the cost of the process of selection by failure is too heavy to be borne. For the individual, the investment of time and money is great; at the end of a long period of training he finds himself largely unfitted for another vocation. For his own sake he should have been diverted to another career at an earlier date. Medical education is costly not only to the individual, but also to society. Medical schools depend very largely on funds derived either from taxation or private philanthropy. Can society afford to spend such large sums in training persons who will never be able to make any use of what they have acquired?

It must be admitted, then, that there is need of a process of selection; that not everyone who aspires to a professional career has a God-given right to receive a long and highly technical training at public expense. During the last six or eight years, we have had experience in selecting medical students. Recently only half, or less than half, of those applying have been accepted, but the number which each school admitted was based on its own determination of the number which it could effectively teach, without any regard to the needs of the profession or of the country as a whole. If my postulates are correct, the time has come when we must still further limit the enrollment of our medical schools in accordance with the real interest and future needs of the commonwealth.

You, who sit before me, hold in your hands the key to this situation. You, and you alone, are in a position to eliminate the excess production of doctors. Not that this can easily be achieved. Though all of you might agree with me that the number of medical graduates should be reduced, there will not be any unanimity of opinion as to which schools should do the reducing. I can imagine someone saying that the large schools should initiate the pruning, that no entering class should exceed 100; and then I can hear the retort that the large schools are also the very good schools, and that the reduction should be made through the elimination of those institutions which have failed to receive substantial support. The situation is, of course, aggravated by the present economic readjustment which has very greatly diminished the income of all institutions of higher learning. Medical schools are, therefore, at present more than at any time in the past twenty years, dependent on their income from tuition fees. A reduction in the number of students means a smaller budget and lower salaries.

It is clear that this problem cannot be solved in an easy and offhand way. It is no less clear that we must begin to find a way or we shall be adjudged incompetent, unable to measure up to the responsibilities that are placed on us.

As in the selection of students by individual colleges the choice has been based on evidence of fitness for a medical career, so in the further limitation which the medical schools must undertake to impose on themselves, our criterion must be fitness and ability to offer the highest quality of professional training. Excluding the two year schools, you have some seventy members of your association. A like number are rated Class A by our Council. No longer are there any designated as Class B. It may be questioned whether we have not become too complacent and self-satisfied, too ready to rest on the laurels already won. The achievements of the last three decades in raising the standards of medical education are without parallel in history, but is the process complete? Can it ever be completed? May we not have set up a standard for our schools and regarded it, like the standard yard in a vault at Washington, as permanent. If so, we must now acknowledge our mistake. The better schools have made great advances since the war. Some have been unable to keep up with the procession. I doubt whether the standards of this Association, or those of the Council on Medical Education, have adequately reflected the improvements of the last ten years. The time is ripe for an advance all along the line. Together we should be able to set up a new and higher standard, a standard which many of our schools have already met and which others, in the course of a few years, will be able to meet. The school which cannot conform confesses its own failure. Such an enterprise is but the logical continuation of the work on which your Association has for many years been engaged. In such an undertaking I now invite your cooperation.

Another phase of this question deserves, perhaps, your consideration. We know that there are more applicants knocking at the doors of our medical schools than the schools can accommodate, than the profession can absorb, or than the public is willing to support. Why this furious stampede to enter a career which to the majority offers and can offer nothing but disappointment? One answer is to be found in tremendous post-war increase in the number of students enrolled in colleges and universities. Other countries have faced similar problems but in none has the democratization of higher education proceeded so rapidly or gone so far. In England the enrollment in institutions of higher learning amounts to one in 1,150 of the population; in Scotland, one in 455. In the United States, one in 125.

It is obvious that those who have spent two or more years in college

turn naturally to a professional career. It is equally obvious that for most of them, no professional career exists. To correct misapprehensions, dispel false hopes, and avoid the tragedy of mistakes, the college authorities must do one of two things—either drastically reduce the number of their students, or else warn them before it is too late that the mere fact of having attended college does not guarantee them an entrance into professional vocation. If higher education is going to make them dissatisfied, they had better stay away from college. Is it not within the province of this Association, which must deal with this problem in its acutest form, to bring the existing situation formally to the attention of the Association of American Colleges and the Association of American Universities, asking them to use their united efforts to drive home to the understanding of the undergraduate student that the professions, law, medicine, engineering, etc., are necessarily limited in numbers, that only a very small percentage of college students can gain a professional career, and that the rest must be content to plan their lives otherwise? May I express the opinion that some such official action by this Association would offer a means of dealing with the difficulty at its source, and that if we do not succeed in turning away the tide of surplus applicants, we shall at least have given them fair warning of what they may expect?

III.

From the Standpoint of the State Universities

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I have been asked to discuss the question of the relation of the number of medical school graduates to the public needs from the standpoint of the state universities. Although three-fifths of our states provide some support for medical education, the state universities play a relatively minor part in the number of medical students graduated. In 1932-1933 the total number of such graduates was 1,524 from twenty-two state universities giving a complete medical course. This is less than one-third of the total number of graduates last year (4,895). The 19 schools of three states—New York, Pennsylvania and Illinois—had a larger number of graduates (1,691) and only one of these schools (the University of Illinois, with 118 graduates) is a state university school.

We may divide the states according to the number of medical school students and graduates last year into three groups of ten each, counting the District of Columbia as a state in the first group. Of the remaining nine-

teen states, six have two year schools approved by the American Medical Association and thirteen have no such schools.

In the first group of nine states and the District of Columbia there are 40 schools (Table I). Last year there were 14,098 students in these schools (63.0 per cent of the total for the United States) and 3,206 graduates from them (65.4 per cent of the total). Less than half the population of the United States resided in these states (47.1 per cent) although their schools graduate two-thirds of the students.

In the second group of ten states there were 17 medical schools with 5,514 students and 1,210 graduates, about one-fourth of the total number of each in the United States last year. The percentage of the total population of the United States in these ten states was 22.5 per cent. The supply of graduates from the medical schools in these states relative to the population of the states was about equal to the general supply for the United States as a whole relative to the population (1:22,800 as compared with 1:25,000); whereas, in the preceding group the supply was 40 per cent higher (1:18,000 as compared with 1:25,000).

In the third group of ten states there are ten medical schools giving a complete course and two preclinical schools. The number of medical students in these schools last year was 2,356 (10.5 per cent of the United States total) and the number of graduates was 479 (9.8 per cent of the United States total). The percentage of the United States population in these states was 14.2. The ratio of graduates to population in this group of states was about 30 per cent less than for the United States as a whole (1:36,400 as compared with 1:25,000).

In the remaining 19 states, there are approved two-year schools in six states. From a similar school in one other state approval was withdrawn last year. In the six states with approved preclinical schools, 5.5 per cent of the population of the United States resided last year. In the remaining 13 states, 10.5 per cent of the population resided. In order to give the same supply of physicians per population for these nineteen states as for the country at large, the schools in the rest of the country would have to educate about 20 per cent more students than if called on to satisfy merely their own needs. Thus, the ratio of graduates to the population of the states with approved schools graduating medical students last year was 1:21,000, whereas relative to the population of the United States as a whole it was 1:25,000. The graduate-population ratios from the three groups of states were, respectively, 1:18,000, 1:22,800 and 1:36,400. Assuming that medical school graduates were to be distributed evenly according to population throughout the United States as a whole, the first group of states would do much more than its share toward supplying states without medical schools, the second group would supply little more than

Table I

DISTRIBUTION OF APPROVED MEDICAL SCHOOLS, STUDENTS AND GRADUATES BY STATES, 1932-33

STATE	Per cent Pop.	TOTAL NUMBER OF Schs.	Students	Grads.	Per cent U.S. Grads	Graduates Population Ratio One to	STATE UNIVERSITY SCHOOLS Number of Schs	Grads	Percent Grads Local	U. S. State U.
New York	10.2	9	2,684	605	12.3	20,800				
Pennsylvania	7.8	6	2,425	587	12.0	16,400				
Illinois	6.2	4	2,233	499	10.2	15,300	1	118	23.6	7.7
Big Three	24.2	19	7,342	1,691	34.5	17,700	1	118	7.0	7.7
Massachusetts	3.5	3	1,223	299	6.1	14,200				
Dist. Columbia	0.4	3	1,087	238	4.9	2,000				
Missouri	3.0	3	955	208	4.2	17,500	1			
California	4.6	4	968	176	3.6	32,300	1	54	30.7	3.5
Ohio	5.4	3	947	214	4.4	31,100	1	86	40.2	5.6
Michigan	3.9	2	809	197	4.0	24,600	1	132	67.0	8.7
Tennessee	2.1	3	767	183	3.8	14,300	1	105	57.5	6.9
First Ten	47.1	40	14,098	3,206	65.4	18,000	6	495	15.4	32.5
Maryland	1.3	2	695	157	3.2	10,400	1(4)	85	54.1	5.6
Texas	4.7	2	682	145	3.0	40,200	1	70	48.3	4.6
Nebraska	1.1	2	653	146	3.0	9,400	1	74	50.7	4.8
Louisiana	1.7	2	645	104	2.1	20,200	1			
Virginia	2.0	2	593	146	3.0	16,600	1	59	40.4	3.9
Wisconsin	2.4	2	592	110	2.2	26,700	1	50	45.5	3.3
Minnesota	2.1	1	470	125	2.6	20,500	1	125	100.0	8.2
Indiana	2.6	1	459	102	2.1	31,800	1	102	100.0	6.7
Georgia	2.4	2	377	90	1.8	32,300	1	38	42.2	2.5
Kentucky	2.1	1	348	85	1.7	30,800				
Second Ten	22.5	17	5,514	1,210	24.7	22,800	9	603	49.8	39.6
Iowa	2.0	1	373	93	1.9	26,600	1	93	100.0	6.1
N. Carolina	2.6	3	291	15	0.3	211,300	1			
Kansas	1.5	1	288	61	1.2	30,800	1	61	100.0	4.0
Oklahoma	2.0	1	255	56	1.1	42,800	1	56	100.0	3.7
Oregon	0.8	1	235	51	1.0	18,700	1	51	100.0	3.3
Colorado	0.8	1	220	47	1.0	22,000	1	47	100.0	3.1
Connecticut	1.3	1	197	38	0.8	42,300				
Arkansas	1.5	1	197	45	0.9	41,200	1	45	100.0	3.0
S. Carolina	1.4	1	150	35	0.7	49,700	1	35	100.0	2.3
Vermont	0.3	1	150	38	0.8	9,500	1	38	100.0	2.5
Third Ten	14.2	12	2,356	479	9.8	36,400	9	426	88.9	28.0
W. Virginia	1.4	1	140				1			
Alabama	2.1	1	107				1			
Utah	0.4	1	65				1			
N. Dakota	0.6	1	58				1			
S. Dakota	0.6	1	45				1			
N. Hampshire	0.4	1	38							
6 Preclin.	5.5	6	453				5			
13 Others	10.6									
Total	100.0	75(1)	22,421(2)	4,895	100.0	US 25,000 SS 21,000(3)	22	1,524		

(1) Mississippi not included. Chicago and Rush counted as one school. One school in Missouri and two in North Carolina are preclinical schools.

(2) Does not include 45 students in Mississippi.

(3) SS means the ratio of graduates from states in which schools are located to the population of these states.

(4) Maryland differs in organization from the typical state universities but is included among them because of its state responsibilities.

its own needs and the third group would supply much less than its needs, on a 1:25,000 general ratio.

The actual ratio of graduates to population in each of the states furnishing graduates is given in Table 1. In the big three states it was 1:17,700, with the highest ratio 1:15,300 in Illinois. For the first ten group as a whole, the ratio was 1:18,000, with the highest individual ratio in the District of Columbia (1:2,000).

In the second group of ten states with an average ratio of 1 to 22,800, the range ran from 1:9,400 in Nebraska and 1:10,400 in Maryland to 1:40,200 in Texas.

In the third group with an average ratio of 1:36,400, the range ran from 1:9,500 in Vermont to 1:211,300 in North Carolina.

The graduates of state university medical schools are about equally divided among the three groups of states. From the five state university medical schools graduating students in the first group of states there were last year 495 graduates. From nine state university schools in the second group there were 603 graduates. From nine state university medical schools in the third group there were 426 graduates. In the first group of states less than one in six of the graduates were from state university schools; in the second group of states one-half were from such schools; in the third group, nearly 90 per cent.

In the big three among the first ten states, New York, Pennsylvania, and Illinois, there is, as stated above, but one state university school, that of the University of Illinois. This is one of four schools situated in Chicago and had last year slightly more than a quarter of the total number of students in approved schools in that city and slightly less than a quarter of the total number of graduates.

Chicago is the urban center for the largest number of medical students in this country. It educates for a vastly larger territory than the state in which it is situated, but the tendency for students to settle near the institution from which they graduate would lead toward an oversupply of physicians for Illinois, and especially for Chicago, even if there were no state university and there is comparatively little that a state university so situated could do to regulate the supply of physicians for the state. What it does do for the state is to open facilities for a career in medicine to many students who could not afford the fees of schools under private auspices, thus equalizing opportunities for higher education which is one of the aims of state universities. To some extent, also, through its graduates settled in the state, it may help toward an equitable distribution of medical service. It likewise serves as an important center for the advancement of medical science. It has the special obligation of study of the economic and social conditions of the state in relation to medical practice and

so far as practical to prepare its students to meet these conditions and for practice in the state.

In five of the other states belonging to the big ten there are state university medical schools. In one of these, Missouri, the school is a two year school and the part played by this school is quite similar to that described below for two year schools in states whose medical education facilities are confined to such schools. In two (California and Ohio) of the other four states with state university medical schools, these schools play a part similar to that of the University in Illinois. In one of these states (California) there are three other schools, in one (Ohio) two other schools. In one of these states there are two urban medical education centers, in the other three. There is, thus, a wider diffusion of these centers than in Illinois. Taking the two states together, the number of students last year in the state university schools (596) was less than a third of the total number in the two states (1,915) and the number of graduates from the state schools (140) was slightly more than a third of the total number of graduates in the two states (390). While the graduates from the state schools are thus proportionately larger in number relative to those from endowed schools in these states as compared with Illinois, the social and economic problems and responsibilities presented are similar in character.

In two of the states of the big ten, Michigan and Tennessee, the state university school dominates in point of number of students and graduates. Out of 1,576 medical students in these two states last year, 890 belonged to the state schools, and out of 380 graduates, 237 were from the state schools. In Michigan, the number of students graduated last year from its two schools had a ratio to the Michigan population similar to that of the graduates of all schools to the population of the United States (1:24,600 compared with 1:25,000). The graduates of the three schools of Tennessee, on the other hand, had a ratio 75 per cent higher (1:14,300 as compared with 1:25,000 of the population). One of the three schools, Meharry, has its special problem of medical education of negroes. In such states as Michigan and Tennessee, the number of graduates from the state university has a more direct bearing on the number of students entering practice in the state than is the case with the other state universities in the group of states under discussion, and an opportunity for a relatively wider influence in the field of medical sociology and economics. In many respects, these two state university schools occupy positions similar to those of the following group.

In the second group of ten states, from the standpoint of numbers in medical education, there are nine state university medical schools. Typically, there are two schools to a state, a state university school and an endowed school. In two states, Minnesota, and Indiana, there is only one

school and that is a state school. In one state, the only school is an endowed school with municipal affiliations (Louisville). In numbers of students, the two types of schools are, in general, fairly evenly balanced. In the group as a whole there were last year 5,514 students, of whom 2,896 were in state university schools, and 1,210 graduates, of whom 603 were in state schools.

As pointed out above, the ratio of graduates to the general population in these ten states about equals that of the total number of graduates to the population of the United States. Taken as a whole, although there are exceptions, there is no reason to assume that these states are furnishing an oversupply of graduates for the United States. If we assume that, in general, the supply of graduates for our present needs is too large, the fault lies rather with the big ten group of states in which the state universities, on the whole, play a minor rôle than with the second ten, in which the state universities play a fifty-fifty rôle from point of view of numbers. The state universities in this second group of states play an important part in providing graduates to meet the medical needs of the state as well as in equalizing opportunity for medical education and in fitting students to meet special situations characteristic of state needs.

In the third group of 10 states with twelve schools, one state has three schools, two of which are preclinical. One of these is a state university school, the other an endowed school. All the other states in this group have one medical school and this a state university school. The graduates of these schools are insufficient in number, taking them as a group, to keep up in the states in which they are situated the present general United States ratio of graduates to population. The difference is one of 40 per cent. These states are certainly not creating an oversupply of physicians from within. Of the six states with preclinical schools only—in five, these preclinical schools are departments of state universities and in one a department of an endowed university. The students in the two year state schools have merely an indirect influence on the total number of graduates in the country and this is relatively slight. Their chief purposes are to equalize opportunity of education in the basal medical sciences for students of varying economic status as a part of the public educational system of the state and to broaden the field of scientific study offered at the university. They have little to do with the supply or distribution of medical care in the states in which they are situated, because the school from which a student graduates influences the location in which he settles far more than the school in which he takes the first part of the medical course. They do, because of low fees, help to make possible a medical career for students of limited means to whom such a career might otherwise be denied, and

to maintain a center for medical science in the state in which each is situated.

Of the thirteen states at present without approved schools, six have a population of less than 500,000. Only four states have a population exceeding 1,000,000. The largest of these states is New Jersey, with a population of more than 4,000,000. While not all of the states without schools are as favorably, or unfavorably, situated as New Jersey, from the standpoint of abundance of supply of medical graduates from neighboring states, most of them are reasonably well so situated. Sometimes, as in the case of Oregon relative to Washington, a state university takes into special consideration the needs of a neighboring state for medical graduates.

When active reform in standards of medical education began in this country, soon after the opening of the present century, the fear was frequently expressed that if standards were raised too fast medical needs could not be met. Increased standards meant increased costs both to the institution and to the student. The state universities were asked to do their share toward insuring adequate provision for medical education. A few state universities were already doing so but these were the exceptions. In general, state support of medical education had been slight. The appeal for support through the state universities was met in some instances through taking over proprietory schools and giving them active supervision and support. In other instances, the scientific departments of the university were expanded to cover the first two years of the medical course. Occasionally such a school was subsequently expanded into a complete school. On the other hand, the clinical work at some state universities was discontinued because the facilities were deemed inadequate to meet modern standards. In some instances the state still gives but slight financial support to the school which bears its name.

Some of the results of the appeal made early this century to the state universities to do their share toward providing adequate facilities for medical education have been described above. The following conclusions may be reached based on these and other data:

1. The state universities have helped greatly to distribute facilities for medical education. Out of 35 states and the District of Columbia in which such facilities meet the approval of the American Medical Association in 16 the state university school is the only institution offering them. Five of these state university schools are preclinical schools. In only two states with but one school in the state is this school not a part of the state university. In one of these instances the school is a complete school, in one a preclinical school.

In 10 states the state university shares with a school not supported by

the state the responsibility for medical education but in most instances carries the heavier part of the burden from the standpoint of numbers.

2. This wide distribution of medical educational facilities affords a basis for adjusting medical education to meet local needs. While it would be unfortunate if all practitioners in a given state were educated within that state and there were no interchange of practitioners educated in different environments, it is, nevertheless, advantageous to have some institutions particularly concerned with specific needs of given localities. The state university medical schools have this function to perform.

3. The average annual tuition in state university medical schools at present is slightly less than $200. In schools not under state support it is more than $400. While tuition is but a part of the cost of medical education to a student, and a difference in tuition of $200 per year is but one factor in opening a medical career to a talented student in limited circumstances, it is a factor. The state universities offer numerous other advantages to such students which are but partially offset by scholarship funds in endowed institutions.

4. Relatively low costs to the student in state university schools have in themselves tended to increase the number of medical students but these schools have, on the whole, had comparatively little difficulty in restricting numbers on the basis of scholarship. Since these schools, in the main, depend relatively less on fees for support than any but the best endowed schools do, they are, as a rule, less tempted than some schools with very limited endowment to seek support through numbers. In the long run, they are not likely to receive requisite state support if they seek to educate a much larger number of physicians than are necessary to meet state needs. The problem of an adequate supply and proper distribution of physicians, therefore, is a vital concern of those in charge of such schools.

5. This problem involves the relation of the supply from the state school to that from other schools within and without the state. In all but eight states last year more physicians were licensed through examination or reciprocity to practice within the state than were graduated from schools within the state. The new supply cannot be judged accurately from the number of those newly licensed to practice. In the United States, 7,062 persons were licensed to practice last year while there were but 4,895 new graduates. The distribution of the new physicians within the state needs to be followed and the underlying factors studied. The state university medical school cannot exercise police power to regulate the distribution of those entering practice but it may endeavor to train its own students in such a way as to make the distribution of its graduates of greatest advantage to the state.

6. At the present time, the supply of physicians is doubtless being increased more than customary by postponement of the usual retiring age. Many physicians who under normal conditions would retire partly or wholly from practice have through investment losses been forced to keep actively at work. The rapid progress of modern scientific medical knowledge requires that the brunt of the battle against disease be carried by youth trained in the newer knowledge if we are to achieve what we should. The guiding hand of the wisdom of experience is likewise essntial. This should be had without undue forcing of the physical stamina of the aging. It is doubtful if we should count on more than thirty years as the average length of time in active practice after graduation.

7. If thirty years be taken as the average length of time in active practice, the number of medical school graduates necessary to keep up a given ratio of physicians to population may be estimated approximately by multiplying the existing ratio by thirty. Thus, if there is one physician to a thousand of the population, we need one graduate each year to thirty thousand of the population to keep up this supply if the population remains stationary. Conversely, the existing ratio of one annual graduate to twenty-five thousand of the population would suffice to keep up a supply of one physician to eight hundred and thirty of the population with the population stationary. In the 1931 American Medical Association directory there are listed 156,444 physicians—1:785 of the population. Taking the country as a whole, the present ratio of graduates to population does not appear to indicate, on the basis outlined, an increasing ratio of physicians to population. All such calculations are necessarily rough estimates but our present supply of graduates appears just about to suffice to keep up our present supply of physicians. All this, provided we import no more physicians than we export. If we import more than we export, the physician-population ratio will correspondingly rise.

8. With due regard for increase of population and other factors, we should not increase the present annual number of graduates unless we desire to increase the present ratio of physicians to population, nor should we materially decrease this number if we desire to maintain the present ratio by means of the graduates of our schools. The chief question, therefore, becomes, Do we desire to increase or decrease the present ratio of physicians to population either in the United States as a whole or in any of its constituent parts?

9. From the social standpoint, the ideal physician-population ratio would be that which best fostered the application of scientific knowledge to the prevention and cure of disease, the relief of suffering and the promo-

tion of health. What this number is no one knows. It doubtless differs with different social conditions. It appears doubtful if, on the average, it should be less than the general present physician-population ratio for the United States, granted adequate financial resources to support such a ratio.

10. From the economic standpoint, the physician-population ratio depends over an extended period primarily on the wealth of the community, although many factors play a part. Thus, for instance, recent graduates may be attracted to a community more by the prizes won by the leaders in the profession than by the average earning of the rank and file. Statistical data gathered by a special committee of the Wisconsin State Medical Society show, however, that, arranged by counties, the physician-population ratio followed in 1930 fairly closely the relative number of individuals with net cash incomes of $2000 and over. The physician-population ratio ran from 1:747 in Dane County and 1:831 in Milwaukee County to 1:2723 in Jackson County and 1:2941 in Taylor County with a ratio for the state as a whole of 1:1066. The percentage of individuals with net cash incomes of $2,000 or more in 1929 ran from 7.7 per cent in Milwaukee County to 0.67 per cent in Marquette County and was only 4.1 per cent for the state as a whole.

Dividing the state into Milwaukee County and into four other groups of counties with from 17 to 18 counties in each group, the following data are obtained:

	Per cent. incomes over $2000	Physician Population ratio	Sq. miles per physician	Population per sq. mile
Milwaukee Co.	7.7	1:840	0.27	3165
Co. Group II	4.3	1:1019	10.58	96
Co. Group III	2.2	1:1188	35.70	34
Co. Group IV	1.5	1:1453	62.90	24
Co. Group V	1.0	1:1641	78.90	21
State	4.1	1:1066	20.00	53.7

Thus one finds most physicians and, as a rule, hospital and other medical facilities as well, where the percentage of persons with relatively large incomes and the density of the population is greatest, and the fewest physicians where the number of square miles to be covered is greatest and the density of population is least.

The most unexpected feature about the data cited above is the relatively small percentage of individuals with net cash incomes of $2,000 or more as shown in the income tax returns. These incomes are incomes before the depression was well started and would be far fewer today. Each net cash income of $2,000 or over supported on the average about three individuals. Thus, in Milwaukee County only 21.6 per cent of the population lived on net cash incomes of $2,000 or over. The rest of the families were living on smaller incomes in 1929. In Marquette County, only 1.8 per cent of the families were living on incomes of $2,000 or over.

The committee of the Wisconsin State Medical Society studied the incomes of 2,129 Wisconsin physicians for the year 1930, about 75 per cent of those in active practice in the state and probably a fair sample. The incomes are averaged by size of community, length of time in practice and type of practice—general, surgical and the specialties. All of these factors need to be taken into consideration to have an average income have much meaning. We cannot here, however, enter into the valuable details embodied in this report. Suffice it to say, that of the incomes studied, 69 per cent were derived from general practice, 14 per cent from surgery and 17 per cent from other specialties. The average income in 1930 for the 2,129 physicians was $7,568 gross and $4,704 net. For the general practitioners, it was $5,322 gross and $2,945 net. For the surgeons, $15,732 gross and $9,275 net. For the specialists in other lines, $9,953 gross and $7,978 net. The median net income for the general practitioners from ten to twenty-nine years in practice was from $2,000 to $2,500 in towns of 2,000 population or less; from $3,000 to $3,500 in larger towns, except in Milwaukee County, where it was from $2,500 to $3,000. For surgeons and other specialists the median net income was from $6,000 to $7,000, irrespective of size of town. About one-quarter of all physicians received a net income of $2,000 or less, and about one-half received a net income of $3,500 or less. These sums, while not large, represent incomes high compared with those received by the large majority of the population and constitute a potent factor in leading youth to enter the practice of medicine. Some of those denied entrance through regular channels go into various cults.

The present depression has been especially hard on the medical profession because it has hit the incomes of those on which chief dependence has been placed for support. It is obvious that no wise planning can be based on present abnormal conditions which long continued are self destructive. Mere reduction in numbers of those going into various pursuits does not embrace the solution. If there are too many physicians, how about the farmers? It has been estimated that we have several times more than we need to feed us adequately; and so on in every other field of human endeavor. We have too much of everything and everybody, except purchasers with cash, and we do not increase cash purchasers by technological unemployment. If we do not discover some equitable method of distributing and rewarding serviceable occupations we are likely to revert to a condition in which society no longer has an abundance. We might revert to the condition of the savage tribes which once roamed this land. And since every tribe of a hundred savages, or so, usually had its own medicine man,

the physician population ratio would then be far worse than it is today.

What we need today is not so much a limitation in the number of medical school graduates as a greater number of graduates who are experts in the field of social psychiatry. The world war and the world depression are evidences of a social insanity or social imbecility which constitute a challenge to the priests of Aesculapius and Hygeia.

IV.

From the Standpoint of the Endowed University

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Almost all of any representative group of the general population have more or less defects or disease of the teeth and their supporting structures. Practically all adults have conditions from which they will sooner or later lose some or all of their teeth. Indeed, most adults, over 30 years of age, have already lost a part, and some have already lost all of their teeth. Generally speaking, the older a person is, the fewer teeth he has remaining; until, if he lives long enough, he will have none.

A table given in the report of the Commission on Medical Education[1] from the Committee on Health Problems of the National Council on Education shows an estimated incidence of defects and diseases of the teeth, likely to be found among school children, of 33.5 per cent for urban populations and 49 per cent for rural populations.

The process of decay of teeth and of alveolar resorption (pyorrhea), by which a tooth is lost, is usually of long duration—several years. As one tooth after another becomes involved, each one in a disease process of many, and some very many, years duration, the result is more or less disease of this nature, throughout adult life, until all the teeth are finally lost.

Caries and pyorrhea, from which practically all teeth are lost, can be treated successfully and the disease process stopped where it is, except in certain teeth in which the disease has advanced too far and the damage already done is too great for treatment. What is more, further development of such diseases in the future can be prevented in practically all instances by proper oral hygiene. A clean tooth does not decay, nor is it attacked by pyorrhea.

The public need for each individual member of society so far as oral

1. Final report, Commission on Medical Education, p. 70.

health service is concerned, comprises proper replacements, repair and treatment of existing conditions, and proper advice and supervision of oral hygiene to prevent further disease.

Dental practice has developed largely as a mechanical art, and some dentists develop great skill in their work in providing substitutes for lost natural teeth and in repairing damaged teeth. The work of many others, unfortunately, is not of such quality as to help the patient much to regain the functions of the teeth he has already lost, or greatly to delay or prevent the loss of others that are diseased.

Treatment of pyorrhea is woefully neglected by most dentists. The disposition, in general, has been to fail to recognize the disease when present, except in the most advanced stage, to ignore it or to regard it as an inevitable condition which is beyond control, except, perhaps, at the hands of certain specialists in this particular disease. Here is a disease present, more or less, in the mouths of almost all adults, from which a part or all of the teeth are lost by practically all who live long enough, receiving little or no effective treatment at the hands of dentists in general, on whom the public must depend, at the present time, for oral health service.

When it comes to the second public need, namely, proper advice and supervision of oral hygiene to prevent further disease, the service is still more inadequate. Even the most skillful dental work, from a mechanical standpoint, too often, is not followed by necessary instruction as to care, or by proper supervision, to prevent further trouble in these same teeth, and especially, to prevent similar trouble in the future in the other teeth that have not yet been affected.

Treatment of conditions relative to the teeth, whether mechanical or otherwise, must always be on an individual basis. Conditions to be remedied in one individual are different from those in another, and conditions in each tooth, in the same individual, are different from those in his other teeth. Instruction and supervision of the technic of cleaning the teeth, so as to prevent further disease, must also be on a strictly individual basis. It is not sufficient to advise that the teeth should be brushed every so often. It is necessary to see that each patient acquires a technic by which he actually cleans each one of his teeth once a day. When such technic is acquired and consistently employed, the general diseases, caries and pyorrhea, from which almost all teeth are lost sooner or later, do not occur.

The woeful inadequacy, either quantitatively or qualitatively, or both, of available and utilized oral health service, to meet the needs of the public, is indicated, to some extent, if one only observes the mouths and teeth of any group of people. As they talk and laugh and show their teeth, or where their teeth should be, one observes that there are few who are not

already crippled and in definite need of oral health service. Such casual observation reveals, only partially, the actual condition that is revealed by careful examination of any group, or of routine patients in any clinic or private practice.

The explanation of the inferior quality of much of the oral health service, at the present time, is indicated by the fact that many of the dentists themselves have already lost or are now losing some or all of their own teeth from the very diseases they pretend to treat or should treat. If they can not save their own teeth, how can they direct others how to save theirs?

But if all dentists were well qualified and did render exactly the service their patients need, it would be impossible for them to take care of more than a small percentage of all of the people in need of oral health service at the present time. Therefore, the public need, in the field of oral health service, is for many more graduates and for graduates better qualified than the average practitioner is to render the service needed today.

I have talked about oral health service largely because it is possible to visualize the situation more comprehensively, and to point out the needs more clearly, than may be done with reference to general health service, which is more complex and complicated. Not that the situation is any better with regard to general health service. It is even worse in many particulars, and the inadequacies are even greater in certain directions.

The following conclusions under the head of Supply and Distribution of Physicians are taken from the report[2] of the Commission on Medical Education:

"There are more physicians in the United States than are needed to provide an adequate medical service for the country.

"The United States has more physicians per unit of population than any other country of the world; twice as many as the leading countries of Europe.

"The present medical schools in the United States are producing more physicians than the country needs.

"The ratio of one physician to approximately 750 persons will be reached in a few years.

"If the annual additions are increased, as seems probable, the number of persons per physician will probably be below 700.

"Available data indicate that proper medical services can be provided on the basis of one active physician to 1,000 or 1,200 persons, depending on the size and type of the community, the organization of the services, and other factors."

2. Final report, Commission on Medical Education, p. 119.

The fact that there are more physicians in this country per unit of population than there are in other countries does not necessarily mean that there are too many physicians here. It may be that there are not enough there. It would be necessary to know that the health service in those countries is adequate for the needs (not only the demands) of the people in those countries, before any great importance can be attached to the relation of numbers of physicians to the general population.

Health service must always be on an individual basis. No two people react to environmental influences and disease in the same manner, physically or mentally. Medical services cannot be supplied on a mass production basis. The physician must continue to deal with the health problems of the individual. Whether the public needs are now being met by the physicians of the country may be indicated by a consideration of the health service which people need and what they actually receive.

The practicing physicians of the country, as a whole, vary greatly in their training and experience and qualifications for medical practice, in conformity with the actual needs of the public. Many had their instruction in medical colleges so long ago that much of what they learned to believe and practice then has been entirely replaced by new facts and practices in more recent times. If they kept up with the progress of medical knowledge as time passes, well and good; but do they?

One way by which a physician keeps up with the advances is by reading current medical literature and new books. The more extensive one's reading, within limitations, the better informed he is and the better he is prepared to use the best medical knowledge in rendering the health service his patients need.

While some physicians continue to read, many others do not. Most of them like to believe that they read much more than they actually do read. Reading consistently, even a moderate amount of well selected medical literature, enables one with a good background, to keep up quite well. Most new facts, having practical application in general practice, appear soon after they are known, in the *Journal of the American Medical Association*. Those who read only this journal, if they do it promptly and consistently, may keep up with the more important advances pretty well, so far as they are available for application in practice. Anyone who has had occasion to call at the offices of many physicians will recall instances in which he has seen an accumulation of the issues of this and other journals, of weeks and sometimes months, still unopened.

The physician's excuse for not reading and keeping up is that he has not the time. He is too busy with his practice. If he is too busy to read, he should take fewer patients and let someone else have the remainder.

If everybody who cannot spare the time to read enough to keep up with the important advances in his field of practice would cut down on the number of patients he serves, there would be need for more physicians to serve the rest.

Another way by which physicians may keep up with advances and keep themselves better prepared to render the health service their patients need, is by attending post graduate study. We may differ as to the length, frequency and content of postgraduate courses physicians should take, but probably all of us believe that physicians would be prepared to give better health service to their patients if they took such courses of some kind from time to time.

One excuse given for not taking postgraduate courses is inability to spare the time from one's practice, and another, to afford the expense.

At the present time only an insignificant proportion of the physicians take postgraduate courses every year. If a large proportion of them did so, the tendency would be to create a need for more physicians to take care of their patients during their absence. More instructors would also be needed at the teaching centers to give the required instruction.

Unfortunately, the facilities and qualified personnel for good postgraduate instruction are entirely inadequate for more than a small fraction of the total number of physicians who should have it. Much of the time of those who do take such courses is wasted in attending major operations which they will not, and should not, undertake and which occur only occasionally in any general practice. Much of their time is also wasted listening to lectures by specialists whose efforts, unconsciously, are directed toward promoting the interests of their own specialized practice. There are too few teachers available who can and do succeed in helping the physician to learn much of practical application and use in his own practice.

The belief or the fact that physicians cannot afford the cost of postgraduate courses, is beside the question. If they are necessary, to secure for the public the quality of health service needed, then it is desirable to find some way of meeting the situation and not simply to acquiesce in incompetent service, for an indefinite time, in the future. The need exists, whether it can be supplied or not.

Diseases and their treatment are concealed in mystery and ignorance in the mind of the average individual. Even the educated and more intelligent often have unbelievably crude ideas of the cause and cure of disease. Blind faith, based on incorrect information, often governs one's actions with regard to health problems.

The selection of physicians is too often determined by unimportant or

entirely misleading considerations. The average person has little ability to differentiate between a well qualified and a poorly qualified physician. He is also unable to recognize the unscrupulous practice that is so often imposed on him. People too often judge the qualifications of a physician by personality, reputation, sensational performances of one kind or another, especially performance of operations which really are no guide as to his qualifications.

As the physician's practice grows, the point is reached at which he can no longer give the amount of time and thought to the problems of the individual case that he formerly could give. He does not have the time he formerly had to devote to study and attending medical meetings, postgraduate work, etc., which would help him to keep up with the progress in his field. He overworks himself during long hours and deprives himself and his family of the pleasure and satisfaction in life that come only from a reasonable amount of rest and recreation. In his greed to hold all the practice that comes his way and to increase his income therefrom, more and more, he shortens his days of usefulness to himself and others.

As the demands of a rapidly growing practice increase and finally reach the point where the physician can no longer give his patients the same personal attention and individual health service that he once could, he still holds all that he can and employs, either directly or indirectly, nonprofessional people to carry out a part of the service he formerly gave himself. He entrusts much of the examination and treatment of his patients to these employees whose ability and judgment in what they pretend to do too often are very inferior to those of a well trained medical graduate. Such employees make laboratory examinations, parts of the physical examination and even take histories, one of the most important parts of the thorough examination of every patient. They give instruction and advice as to treatment and apply treatment which should be done only by the physician himself.

The public needs would be better served if each physician limited the number of people he serves to the number to whom he can give, personally, that individual attention that is so necessary for the best health service. It may be said that there is no prospect of any change in the direction suggested; that physicians always are going to grasp and hold all they can get, placing the patient's interest secondary to their own selfish interests and greed. While it must be admitted that this may be true to a large extent, it is also true that the demands of an enlightened public may tend to change it. Progress of enlightenment of the public in health matters is very slow, it is true, but there is some made all the time.

Whether in response to the demands of a more enlightened public, or

as a result of a changed attitude and consciousness on the part of physicians themselves, any tendency for physicians to limit their practice to what they can do well, will tend, to the same extent, to increase the need for more medical graduates to do what otherwise would be done poorly by those who try to do too much.

Those who can afford to pay, go to private physicians for their medical service for sickness or injury, but a large part of the public must depend either on contract physicians employed by sickness benefit societies or organizations, or on public clinics. The small fees paid for contract society practice and the large number of patients served by the physicians who engage in it, lead to incomplete and inferior service. It goes without saying that most of the patients do not get the health service they need. Perhaps, they get what they pay for but that is not what they need. If the actual needs of such people were provided, more medical graduates would be required to provide them.

It is not necessary to dwell upon the inadequacy of the health service received by people who have to go to public clinics. The charity patient needs just as thorough an examination, just as accurate a diagnosis and just as effective treatment as the private patient. Even minor illnesses or injuries can be treated best only in the light of full information as to all other underlying conditions or abnormalities of the individual which may influence the course of the disease. Such information can be obtained only by the same complete history, and physical and laboratory examinations, as are required for private patients. The usual hasty, superficial, inadequate service which such patients receive, no more meets their needs than it would the needs of private patients.

The deficiency in charity institutions is met, to some extent, in a way, and in a very poor way at that, by delegating a good part of what is done for such patients, to technicians and unpaid and unsupervised interns and others. Such delegation of services that should be rendered by physicians, and can be rendered by them much better, is contrary to the best interests of both the medical profession and the patients. If there were less of it, there would be need for more physicians. One has only to recall the hasty, insufficient, impersonal examination and treatment of large numbers of patients in the crowded outpatient clinics of the country to realize that it would take much more and much better professional service to meet the needs of this large group of the people of the country.

While much of the needs arising from sickness and injury are met through private physicians, contract and society practice and charity hospitals and clinics, a considerable amount, now, only receives self-medication in the form of secret nostrums, patent medicines and other equally worth-

less and sometimes harmful remedies. A statement in the Commission report[3] would indicate that the expenditure for self-medication is more than $500,000,000 annually. As the public becomes more enlightened on health matters and as the services of physicians improve so as to more nearly meet the needs of the public, to that same extent, more medical graduates will be needed to care for the sickness and injury now cared for through self-medication.

Thus far we have discussed sickness and injury for which the public seeks the services of the physician. There is another phase of the health service that the public needs which will occupy the time and talents of still more graduates, if it is ever demanded to any great extent, viz., prevention as applied to the individual. We say, and I suppose most of us believe, that most people should have a health examination from time to time, whether they know they have any disease or not. By such examination, disorders and conditions are discovered in their early stages, when remedial or preventive measures may be most beneficially applied. The public is slow to demand this kind of health service but the medical profession is still slower to supply it. Nevertheless, it is a need, although not demanded or supplied at the present time.

During the past fifty years the average span of life has been greatly lengthened through public health measures and to some extent through personal hygiene. The future offers still further benefits in this direction.

Lengthening of the span of life means, in the long run, increased need for medical service. The longer a person lives, on an average, the larger the total amount of health service he will need during his lifetime. This would also indicate a need for more graduates in the future rather than less.

Conclusions

We have suggested a number of places at which the health service is not entirely meeting the genuine needs of the public at the present time, either quantitatively or qualitatively. There are still others.

All this is offset to some extent, it is true, by some harmful, worthless, unscrupulous or unnecessary practices, which should be abandoned. The chances of there being an oversupply of physicians above the public need are not such as to justify serious concern at the present time.

Medical education should concern itself with promoting and improving the quality of the medical service, more in line with the health needs of the public, rather than any curtailment, at the present time, of the number of medical graduates.

3. Final report, Commission on Medical Education, p. 38.

Discussion
on Papers of Drs. Rappleye, Cutter, Bardeen and Bass

DR. WALTER L. BIERRING (President-Elect of the American Medical Association), Des Moines, Ia.: To one regarding this topic from the viewpoint of the general field of practice and the profession as a whole, this discussion has been a distinct contribution in the way of information and offering suggestions that seem practical in the solution of this rather acute problem.

The commission which this Association established has presented as comprehensive a survey as is possible, and there seems little doubt that the oversupply of physicians or graduates is a distinct problem at this time. But, at the same time, as Dr. Rappleye has mentioned, there are many variables and there are conditions which probably offset, to a certain extent, perhaps, the seriousness or the urgency of finding a solution.

It is a natural tendency to place the responsibility on the educative forces and primarily on the medical schools, but I am sure there must be a coordination of a number of other interests if we are going to solve the problem as it exists today.

It is true that if we lived in a country with a Mussolini we might have a vacation period of five or ten years in medical schools. I was told this morning that Mussolini tried this, but that was the one thing he was unable to accomplish. He wanted to reduce the number of schools of Italy to six or eight universities.

That we have this extra number of physicians we know. There is the possibility that with the depression period and the anxiety incident to it, the mortality rate may be greater within the next few years, and that, to a certain extent, may solve the difficulty. But, on the other hand, it does seem that the profession, as a whole, can do much to remedy the matter.

The limitation of schools is possible, and here the Council on Medical Education of the American Medical Association can do much. There can also be a distinct curtailment of certain schools. There is no question about what was said by Dr. Bass, that quality of service and greater attention to individual medical care will do much to occupy the services of many physicians that are not now used.

Again, the gospel of health and the prevention of disease should be within the knowledge of every citizen, and there is a great responsibility on the part of the medical profession to bring to the people the achievements of medicine. Many of these so-called non-medical services now under the guise of social service should be rendered by physicians and thus open up a much larger field for activity.

In the overcrowding of other professions there has been the natural tendency to limit the source of the supply and, as is possible in a country like Sweden, it is possible to have governmental control of the supply in the same way that the old trade guilds limited their supply at the point of entry.

One may question the wisdom of a university that admits into its premedical courses, say, 300 students each year, when it knows that two or three years hence it can only accommodate 100 of those, or even less in its medical school.

The greatest concern of this commission was the great number of high school graduates who wished to enter the profession. It does seem we should seek the solution farther back in the students' course. In the selection, the adaptability tests should be applied to the high school graduate, or even to students in the latter

years of high school. There should be frequent qualifying and adaptability tests during the premedical courses. It almost seems as though there should be a distinct reformation of the entire preparatory course. The demand for medical education has increased to such an extent that we might well think of a preparatory course based on an entirely different plan than exists at present. The requirements in physics, in the other physical sciences, in the biological sciences; the necessity of training in the languages, in public speaking, and in mathematics are so different from our former conception of the preparation that if a definite course were outlined far back in the high school years, extending and including at least three years of college education, we would have an entirely differently prepared set of students, and gradually you would limit the number being admitted into the medical schools.

It seems to me that only in this way, by an entirely different preparatory course, and by a better utilization and application of medical services to meet the needs of the time, will it be possible in the course of years to present the solution to this problem.

Dr. G. Canby Robinson (Cornell University Medical College), New York City: The question of when the brakes should be put on or where the discouragement of too many men going into medicine should be applied is the thing I have thought of a good deal. There is the time when the boy is deciding on his career. Then there is the time when he enters the medical school, and then there is the time when he enters practice.

The schools have a very definite responsibility in at least presenting to those considering the study of medicine the problem of the number of physicians and the opportunities of medical graduates. We do not want to see our graduates, as was said of a class of engineers, all dressed up and nowhere to go. Yet there is much to be said for the idea that competition, after all, is of great value. However, to my mind competition is a relatively poor plan in determining who are to succeed in medicine because the public judges the competition, and the public is not very safe always in its choice or its encouragement of the men who have the best minds and the best training and the best spirit.

The problem that ought to be borne in mind is how to regulate the number of physicians so that we diminish the number, as far as possible, of poor practitioners and unscrupulous methods in medicine and the general lowering of medical practice. I am sure that goes hand in hand with the number of physicians to the population and with the economic pressure upon the medical profession.

Another point that has been in my mind in regard to this matter is how to regulate the number of medical students to the needs of the public, and at the same time continue to get the best type of men into medicine. If we have a situation where the outlook in the profession is not good, we will not get many of those studying medicine who are particularly gifted, men who can make a success in any field or in a number of fields. If the chances in medicine are bad, they are not so apt to go into medicine. That is an intangible sort of thing, but I think it is something to be borne in mind.

We should, in other words, endeavor to regulate these problems so that we are going to continue to encourage the very highest type of men and women to enter medicine. As Dr. Bardeen said, of course we can not reduce the number of

doctors and of farmers, and so on, until there is nothing for large numbers of people to do. This is a complex problem, and one of very great interest which I am sure should hold the attention of medical education for certainly the next years to come.

DR. O. W. HYMAN (University of Tennessee), Memphis: We have recognized in the state of Tennessee for some years that while we had other functions to perform, our primary excuse for being was to supply the medical needs of the state that supported us. Consequently, our policy has been directed chiefly to what we conceive to be the needs of our state.

One of the first things that came to our attention, as it does to anyone of course, is the fact that, while we have enough physicians, if we take the population of the state and calculate so many people to so many doctors, there were, and still are in our state, wide territories in which it is true that medical service is inadequate.

I believe that the schools are not entirely helpless in the face of this situation. We find in Tennessee that from 70 to 75 per cent of the graduates of medical colleges return to their home communities. Assuming that this is not an accident, we believe we have influenced the distribution of our graduates in the following way: In those territories where the need of physicians is acute, we have sought to stimulate the interest of young men in the study of medicine through their county newspaper and their school teachers. Possibly, largely as a result of that, enrollment of students in the University of Tennessee and in other schools of the country from those territories has very largely increased, and, beginning as early as 1927, the tendency of graduates to concentrate in the cities of Tennessee began to diminish.

I have recently had occasion to check up on what has become of our graduates since March, 1931. We have graduated about 300 men in that time. About 180 of them are still in hospitals, and about 120 are located. Of the 120 that have adopted a location, all but 23 have located in towns of 10,000 people or less. The ratio of those who have returned to their homes remains the same as it was ten years ago, 70 per cent.

We believe that suggests a rational method of selecting students from the point of view of improving the distribution of physicians. We are well aware of the fact, of course, that this leaves some important factors out of consideration, but as meeting the needs of our local community, we believe we are on the right trail in the selection of students.

One of the points Dr. Rappleye has adduced, if I understood correctly, in predicting a reduction in the need for medical care has been the widespread increase of public health service.

DR. RAPPLEYE: In some directions; not all.

DR. HYMAN: I question whether or not we are likely to have that result. It seems to me that possibly what will happen will be that the number of contagious diseases will be reduced and a corresponding increase in the diseases of degeneration is bound to come. There may be a lag in between. It seems to me the widespread development of public health service is not likely to reduce the extent of

morbidity, but will simply shift it from one kind of disease to another. In other words, we are always going to have a 100 per cent death rate. That is, it is certain that we are all going to die, and whether we die in childhood from measles or in old age from heart disease, we are likely to furnish material for physicians.

DR. RICHARD E. SCAMMON (University of Minnesota), Minneapolis: This has been a most interesting discussion and the title chosen for this symposium was a verry happy one. But it was soon evident that the subject considered was somewhat more complex. Were we considering the relation of the supply of medical graduates to the public, or were we considering the supply of medical graduates according to the public desire for medical service, or were we considering the number of graduates from the standpoint of effective demand for medical service; in other words, inability to pay? Certainly, there are three different points of view in regard to this matter, and these three points of view have been brought forth during the discussion.

Regardless of whether one is interested in the supply of medical care from the standpoint of need, of desire, or effective demand, the limiting factor will be the number of people needing, desiring or demanding the service; in other words, the population.

We have very good reasons for believing that in this country, unless something most unexpected happens, within a generation we will be practically out of stationary population. So it seems to me that further discussion of this problem, which will undoubtedly continue, should always be had with the thought in mind that we are rapidly approaching, so far as we can tell (and social statistics regarding population are as reliable as all social statistics), a saturation point in people and, therefore, also in need, desire and demand.

The distribution of the recent graduates, which has been mentioned several times this morning as being an unequal one and that the recent graduates pour into the cities, is not at all surprising because that is where the population is going. Within the last ten years the cities have grown in population by about fourteen million. In the meanwhile, rural communities have decreased by one million, so it seems to me that this is a perfectly natural movement of medical men. There may quite well be a shift the other way. We do not know what has happened since 1930. It may quite well be that there is a throwback to the country. Certainly, that shift was in response to the distribution of persons.

Finally, I would like to say that we are controlled in this matter apparently pretty largely by our number of applicants. No one is under compulsion to study medicine. Individuals enter the study of medicine because for some reason they desire to do so. This desire to study medicine is similar to the desire which pervades practically every other profession.

In the census of 1820, about 2 per cent of the population was found to be engaged in professional occupations. In the census of 1920, taken 100 years later, 4 per cent of the population was in professional occupations. In the census of 1930, ten years later, 6 per cent of the employed population was in professional occupations. In other words, the proportionate increase in the last decade in the professional occupations was equal to the 100 years preceding it.

Part of this was due to the establishment of all sorts of new professions. Part of it was due to the increase in accretion of the professions themselves.

Why have we had this great increase in entrance into the profession? Part of it is undoubtedly due to the general spread of education. Is not part of it also due to the fact that fewer people are needed in the basic industries? In a state like mine, for example, in the decade between 1920 and 1930, the number of farmers has decreased, the number of miners has decreased, the number of people engaged in heavy and light manufactory has decreased, and the number of people in transportation has decreased. Practically, the only groups that have increased have been those engaged in distribution and those engaged in the professions. Yet, there has been more ore mined, more food raised, more traffic, and there has probably been an equal amount of increase in heavy and light manufactory.

I would put these one or two suggestions before you simply to indicate that it was not an original sin on the part of the applicants wanting to enter medicine. It is a general social problem, and probably its solution will come along with that of other general social problems rather than an immediate, narrow solution in our own field for which we are responsible.

DR. H. G. WEISKOTTEN (Syracuse University), Syracuse, N. Y.: This problem should be considered on a nation-wide basis. It is not at all a problem that can be considered on a provincial or state basis.

My studies have indicated that 50 per cent of the graduates of the medical colleges in this country practice in some state other than that in which the college from which they graduated is located. Apparently, from 70 to 75 per cent of the graduates of some of the state supported schools practice medicine outside of the state.

There may be a changed tendency in Tennessee, but of forty-seven graduates of 1925 reporting to me in 1931, only thirteen were practicing in Tennessee. That was six years after graduation.

I think the statistics we have indicate that this whole problem of the oversupply of graduates must be considered on a country-wide basis. There is undoubtedly much in what Dr. Bardeen says, that we must consider the distribution of the facilities for medical education.

DR. HUGH CABOT (Mayo Clinic), Rochester, Minn.: I am perfectly in agreement with the majority in thinking that this is a tremendously absorbing and important question. I also think it a good deal like a hedgehog; it is covered with prickles. We can very easily spear ourselves on various aspects of the question.

In many of the discussions, not, I think, strikingly those which have been held this morning, there have been certain tendencies to argue from certain alleged collections of facts which seem to me very dangerous. In the first place, we hear constantly the argument that because a good grade of medical service is supplied in Scandinavia, with a ratio of physicians to population of 1 to 1,800, that these facts have some important relation to our situation here. I assert that they have none.

A brief and cursory and, I think, perhaps careless study of the situation in five or six foreign countries in which my person and family have been involved has convinced me that there is no country in the world at the present time, unless it be England, in which the average American can receive the grade of medical

attention which he has come to believe necessary. In other words, the medical service in many other countries is very well suited to the demands of those countries. I think, for instance, that Denmark is, perhaps, the outstanding country in which the people and the medical profession are very well adjusted to each other, but I am not at all prepared to assume that if we should transfer the precise conditions in Denmark to this country that anybody who properly represented the public would be satisfied with it.

In other words, figures of one physician to 1,800 to 1,400 or 1,000 leave me perfectly cold. The question is: What are the American people going to demand in the way of service? I do not know, but I think they are going to demand (they do today demand) a very much more complete medical service than is supplied on the average by the systems in operation elsewhere. I think it a part and parcel of our higher standard of living. We have a higher standard of living which we hope to maintain. That will carry with it, I believe, a higher standard of medical service and, I suspect, service in other particulars. So, until it can be shown what grade of medical service it is desired to produce, we are nowhere in our discussions of numbers.

Another thing that runs through these discussions and seems to me to confuse them is the very common statement, repeated on the highest authority, that there are in this country at the present time too many specialists. I am inclined to deny it. There are too many people who call themselves specialists. If we should apply to these alleged specialists any test to which this group, or any other properly educated group, would be willing to accept, I am satisfied we should not find that we had too many specialists, but that we had too few specialists. By a specialist I mean a person whose background and training qualifies him to deliver special service. I do not believe that one in ten of the people now classified as specialists could pass such a test.

If we say, "Let us remedy that situation," I think we could not do it. I do not believe that there exist in the country today half the facilities necessary to thoroughly and satisfactorily train the number of specialists probably required to fit with the number of "generalists," to turn out a satisfactory, rounded whole.

I believe that one of the next problems before medical education, and which is, perhaps, going to supersede the problems we have been discussing so much for many years in regard to undergraduate education, is the education of the specialist. We are not equipped to do it now.

It is, perhaps, true that some of the schools now giving undergraduate education should abandon undergraduate education as has been suggested here this morning and take over the business of postgraduate education.

Finally, the point on which I want to lay stress is that apparently there is a good deal of demand within the profession for a pretty prompt limitation of numbers. I have already suggested that I do not know whether the numbers ought to be limited or not. Dr. Bass has pointed out that there may be legitimate doubt.

Let us assume for the moment that the numbers ought to be limited. I suggest that the people who ought not to limit them are the profession itself. The minute the profession itself, acting, let us say, through its great central organization, the American Medical Association, undertakes to limit its numbers, it may lose touch and step with its public. It will approach the organization of the trade union. There has been a good deal of suggestion in various state legislatures, before

whom I have spoken in the last twenty years, that there were certain aspects of organized medicine which did in some way suggest a trade union. I think we want to be very careful, if there is to be a limitation of numbers, that it shall not be made by the profession itself.

You will at once ask: Who else is to make it? I think we have at least a refuge there. A great majority of the schools at this time are associated with universities. I believe the limitation, if it is to be made, should be made on the educational basis and not on the vocational basis.

The universities are today properly regarded by the population in general as a fairly disinterested group, and I think the people will be willing to leave in their hands the decision of whether there should be a diminution or an increase. But I think the profession itself will be well advised to at least camouflage any attempts it may make in this direction, or it may easily get a painted countenance as a result.

DR. NYGAARD (Mayo Foundation), Rochester, Minn.: I agree with Dr. Cabot. The conditions abroad and here are too different to be directly comparable. In spite of this, it might interest you to know how my own home country, Norway, has met the situation that you have been discussing here today. To understand the situation properly, three main factors should be kept in mind. The university, with the medical school, is a government institution. The medical school is free. There is only one medical school. The medical course is divided into two main parts. During the first three years the students are educated in anatomy and physiology, mainly. During the next four years, which finishes the medical course, the students are trained in the clinical disciplines.

Because of the increasing number of medical students, far above the actual demand, the medical society proposed in 1922 limitation of the medical students to 100 per year. Statistically, it was computed that about seventy physicians, that is, less than 2 per cent of all active physicians, had to be replaced each year. The law was defeated, and the students continued to pour in. In 1925, the medical society and the medical faculty proceeded along a different line. As no law could be agreed on, they pronounced the education in the clinical disciplines to be very unsatisfactory, with the teaching and hospital facilities at hand and with more than 400 students in all during the last four years of the course. If a larger number was to be forced through, the society would urge the authorities to build a new hospital and double the teaching staff. This last alternative was out of the question.

Since 1925, we, therefore, find the following system in Norway: There is no limitation to the first part of the medical course. The entrance to the last part, to the clinical course, is limited to 100 students a year, or fifty a semester. The students qualify for entrance by examination, and are ranked according to their marks. Of those who qualify, the last one in any given class has preference over the best one in the next class for entrance into the clinical part of the course. There has been an ever increasing number of students waiting after completion of the first part of the course. This was explained and predicted before the limitation got under way, and the students were warned about this complication in their medical course. That this warning has been futile is shown in the statistics of 1932: 795 students were then waiting to enter their clinical training.

That this condition is quite unsatisfactory to everybody is obvious, and appears to be next to the worst. The worst would be a proletariat of physicians striving to make both ends meet in a competition which would be disastrous to medical ethics and dangerous to the welfare of the patient.

Dr. William D. Cutter (Council on Medical Education and Hospitals, American Medical Association), Chicago: Several of the speakers this morning having called attention to the fact that while the number of physicians in the country may be adequate, the distribution of physicians in the country may be adequate, the distribution of physicians is inadequate, and having pointed out that there are certain communities where adequate medical service is not available, I am tempted to recall to your minds that about ten years ago a very careful study of the distribution of physicians in this country was made by Mayers and Harrison under the direction of the Rockefeller Foundation. The report of this study was published by the Foundation, and, I believe, is still available. That study, which was most thorough and comprehensive, led to the conclusion that there were physicians in every community in the United States where a doctor could be supported, and those communities which lacked medical service were those which were unable to pay for it.

A similar analysis was made at about the same time by Raymond Pearl. He studied the migration of physicians over a period of years and compared it with the fluctuating wealth of the respective communities, and the conclusion he presented before one of our congresses was that the doctors went wherever it was possible to make a living, and they did not stay where they could not make a living. In other words, as he said, the doctors were not morons.

At one of our meetings, Dr. Lyon, about the same time related a story of what happened in Minnesota, I believe. It seems that far in the north woods in the middle of winter some trappers committed a very atrocious and brutal murder. Because of the isolation of the spot, and the time necessary to bring word of this crime to the police, and the further delay while the police returned to the woods in an effort to apprehend those who were guilty, the search was futile and the criminals escaped. There was so much public indignation aroused over the fact that there was no way of punishing the murderers that the legislature immediately passed a law forbidding anyone to commit a murder more than fifty miles from a railroad station.

Analysis of Entrance Credentials of Freshman Class of 1932

FRED C. ZAPFFE

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For many years there was much discussion as to how much preparation for the study of medicine was possessed by those entering on such study. The minimum requirements for admission to medical school had slowly been raised from high school graduation, with allowable conditions to, eventually, two years—or 60 hours—of college work of a prescribed standard and content, with no conditions.

It has been maintained or asserted that the minimum was too low; that it was too high; that more applicants came with the minimum preparation than with more than the minimum. Guesses were made as to how many matriculants possessed a degree; whether the number was increasing year by year; whether it was not true that the majority of applicants merely attempted to meet the minimum, regarding it as a necessary prescription to be met if medical study was to be entered on; or were they in any way actuated by a real desire for knowledge, for such education, in content and scope, as would prove to be a good preparation for the study of medicine.

In order to answer some of these questions, if not all of them, a study of the premedical work done by those entering on the study of medicine was undertaken in 1928 and it has been continued to the present time, over a period of five years.

A review of the results of these annual studies shows conclusively that the number of applicants offering only two years of college work for admission to medical school has steadily fallen off; that those with three years of preparation apparently are of about the same number, and that those holding a degree have increased in numbers. Thus, for one reason or another, prospective medical students have taken the matter into their own hands by seeking a better preparation, at least in point of time, from year to year. Probably no harm is being done by keeping the minimum at two years of college work; in fact, it may be very desirable to do so because it gives opportunity to accept an unusually choice student who has prepared himself better for the study of medicine in two years than many students have succeeded in doing in four or even more years. The accomplishment of these two groups of students during the first year in medical school would tend to bear out this point of view. There should be provided op-

TABLE 1. ENTRANCE CREDENTIALS, CLASS OF 1932, BY SCHOOLS.

TABLE I. ENTRANCE CREDENTIALS, CLASS OF 1932, BY SCHOOLS.

School	Admission Requirements	Degrees			4 or More Years No Degree	3 Yrs.	3+ Yrs.	2 Yrs.	2+ Yrs.	Total	
		A.B.	B.S.	Others							
Alabama	70 hrs.	29	11	3	1	3	9		2	58	1 A.B.-M.A.; 1 A.B.-L.L.B.; 1 A.B.-Ph.G.
Arkansas	60 hrs.	7	5		2	4	5	11	15	49	
California	3 yrs.	14	7	1	11	23	4			60	1 Ph.G.-Ph.C.
So. California	3 yrs.	20	2	4	2	10	16			54	1 Ph.B.; 3 Ph.C.-B.S.
Stanford	3 yrs.	18	2	4	4	22				50	3 Ph.G.; 1 B.S.-M.S.
Med. Evan.	2 yrs.	11	1	1	2	16	7	26	35	99	1 B.S.E.
Colorado	60 hrs.	18	3	4	4	17	2	13	1	62	1 B.S.-Ch.E.; 1 Ph.C.-B.S.; 1 A.B.-M.A.; 1 Ph.C.-B.S.-Ph.G.
Yale	Degree or combined course	35	8	8		1	1			53	1 E.E.; 4 Ph.B.; 1 A.B.-D.D.S.; 1 A.B.-M.S.; 1 B.S.-D.D.S.
Geo. Washington	2 yrs.	18	11	2	3	10	12	16	8	80	1 A.B.-M.A.; 1 B.S.-M.A.
Georgetown	90 hrs.	24	78	14	3	8	27			154	8 Ph.B.; 2 Ph.G.; 2 D.D.S.; 1 B.S.S.; 1 A.B.-M.A.
Howard	60 hrs.	13	24	2	1	4	7		1	52	1 A.B.-D.D.S.; 1 L.A.B.
Georgia	2 yrs.	8	4		1	2	2	10	13	40	
Emory	60 hrs.	13	7	3	3	12	9	3	9	59	1 A.B.-A.M.; 1 A.B.-M.S.; 1 B.S.-M.S.
N. Chicago	2 yrs.	15	43	2	3	13	4			80	1 B.S.-M.S.; 1 Ph.B.
Northwestern	85 hrs.	35	33	5	8	32	13			126	1 B.S.-Ph.D.; 1 Ph.B.-B.S.; 1 A.B.-M.S.; 1 A.B.-Ph.D.; 1 A.B.-M.A.-Ph.D.
Illinois	60 hrs.	11	22	5	3	35	2	85	10	173	3 Ph.C.; 1 Ph.B.; 1 A.B.-B.S.
Loyola	60 hrs.	5	23	2	8	25	3	69	5	140	1 Ph.G.-B.A.; 1 Ph.B.
Chgo. Med. Coll	60 hrs.	3	8	2	7	9	2	8{1—1y; 1—1+y}4		45	1 Ph.C.; 1 Ph.G.
Indiana	62 hrs.	19	8	4	3	30	2	44	11	121	1 A.B.-B. Mus.; 1 Ph.B.; 1 B.S.-M.S.; 1 B.S.-Ph.C.
Iowa	60 hrs.	26	3		4	26	5	44	4	112	
Kansas	60 hrs.	13	6	3	4	27	2	15	3	73	1 B.S.-Ph.C.; 2 A.B.-M.S.
Louisville	60 hrs.	21	17	2	3	31	4	2	5	85	1 A.B.-B.S.; 1 Ph.B.
Tulane	60 hrs.	23	22	1	7	51	3	22		129	1 Dr. of Pharmacy
Louisiana St. U	60 hrs.	9	3	3	4	19	1	11	2	52	1 B.S.-Ma.; 1 Ph.G.-B.S.; 1 Ph.G.
Maryland	60 hrs.	33	21	20	6	29		7		116	16 Ph.G.; 4 Ph.B.
John Hopkins	Degree	53	14	4						71	1 A.B.-A.M.; 1 A.B.-M.S.; 1 B.S.-M.S.; 1 A.B.-M.S.-Sc.D.
Harvard	3 yrs.	95	21	3	1	5				125	1 Ph.B.; 1 B.S.-M.S.; 1 A.B.-M.A.
Boston	90 hrs.	28	26	5		11				70	2 Ph.B.; 1 Ph.G.; 1 Ch.E.; 1 A.B.-A.M.
Tufts	60 hrs.	40	42	8	2	27	3	1		123	5 Ph.B.; 1 B.Che.E.; 1 D.M.D.; 1 Ph.G.-Ph.C.
Michigan	90 hrs.	38	7	2	6	63	6			122	1 A.B.-M.S.; 1 B.S.-D.V.M.-M.A.
Detroit	3 yrs.	27	13	2	1	40	5			88	1 B.S.-M.S.; 1 A.B.-Ph.C.-B.S.
Minnesota	90 qt. hrs.	19	2		11	24	1	33	7	97	
Mississippi	60 hrs.	4	5			7		6		22	
Washington U	90 hrs.	55	8	3	5	8	1			80	1 A.B.-M.S.; 1 A.B.-B.S.; 1 B.S.-M.S.
Missouri	90 hrs.	10	5		6	17	6			44	
St. Louis U	60 hrs.	36	31	5	10	40	11	21	13	167	3 Ph.B.; 1 Ed. B.; 1 B.P.E.
Nebraska	65 hrs.	5	6	1	2	30	10	31	6	91	1 B.S.-M.A.
Creighton	60 hrs.	14	14	6	6	25	7	26	2	100	2 Ph.B.; 1 Ph.G.; 2 A.B.-M.A.; 1 Ph.C.-B.S.
Dartmouth	86 hrs.	19	1			1				21	
Columbia	3 yrs.	78	20	5	2	2	4			111	4 Ph.B.; 1 B.S.-M.S.

NOTE: Twenty-seven schools did not have any students with less than 3 years of college work although the published entrance requirements of 53 schools are less than 3 years of college work.

TABLE 1—(Continued)

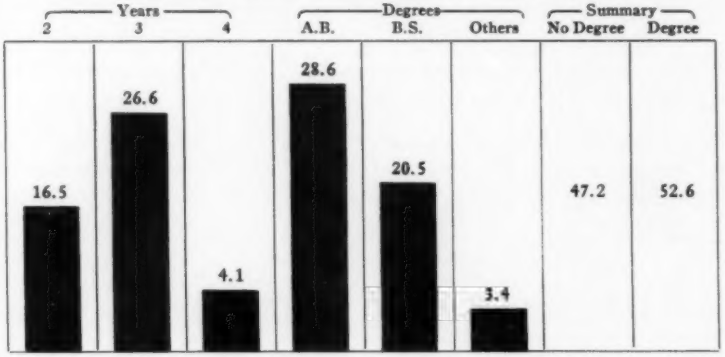
School	Admission Requirements	Degrees A.B.	Degrees B.S.	Degrees Others	4 or More Years No Degree	3 Yrs.	3+ Yrs.	2 Yrs.	2+ Yrs.	Total	
Albany	2 yrs.	29	5		1		2			37	
Buffalo	2 yrs.	22	6		1	17	1	34		81	
Long Island	72 hrs.	44	47	5	1	3	7			107	4 Ph.B.; 1 B.P.E.
New York Homeo	2 yrs.	18	36	4	3	21	2	3		87	2 Ph.G.; 1 Litt.B.; 1 Ph.G.-Ph.C.
Syracuse	60 hrs.	21	4		1	15	9		2	52	
U. & Bellevue	3 Yrs.+Degree after 1st yr. Med.	38	75	3	1	26				143	2 Ph.B.; 1 B.T.E.
Cornell—N. Y.	3 Yrs.+Degree after 1st yr. Med.	32	14	2	1	3	1			53	2 Ph.B.
Cornell—Ithaca		13	2			1				16	
Rochester	3 yrs.	18	14	1	1	7	1			42	1 D.M.D.
N. Carolina	2 yrs.	13	4		1	12		2	1	33	
Wake Forest	2 yrs.		13			8	6		2	29	
Duke	70 hrs.	11	9	2	2	14	4		7	49	1 Ph.B.; 1 A.B.-M.S.
N. Dakota	2 yrs.	8	6	1	3	3	4		2	27	1 D.D.S.-B.S.D.
Western Reserve	3 yrs.	65	10			1				76	
Ohio State U	2 yrs.	48	5	3	4	32		8		100	1 L.L.B.; 1 A.B.-M.S.; 1 B.S.-M.S.
Cincinnati	60 hrs.	11	7	1	1	10	6	27	21	84	1 Ph.C.
Oklahoma	Degree or 60 hrs.	10	9	4	10	25	6	9		73	1 A.B.-B.S.; 1 A.M.; 1 Ph.C.-B.S.; 1 R.N.
Oregon	62 hrs.	21	11	2	5	18	5	1		63	1 Ph.B.; 1 Ph.C.
Pennsylvania	3 yrs.	66	45	3	3	4	12			133	1 B.S.-A.M.; 1 A.B.-M.A.; 1 A.B.-M.S.
Jefferson	3 yrs.	59	86	11						156	6 Ph.B.; 3 B.S.-M.S.; 1 A.B.-M.S.; 1 B.S.-Ph.G.
Woman's Med. Coll	60 hrs.	11	7	1	3	8	1	3	1	35	1 A.B.-A.M.
Hahnemann	60 hrs.	23	41	5	11	42	5	9	4	140	1 V.M.D.; 2 Ph.G.; 1 Ph.B.; 1 D.D.S.
Pittsburgh	60 hrs.	3	20	1	1	9	3	27	3	67	1 B.P.E.-B.S.
Temple	3 yrs.	20	56	1		35	4			116	1 Ph.B.
S. Carolina	60 hrs.	7	11		3	12	1	2	3	39	
So. Dakota	60 hrs.	8	2		1	8		6	2	27	
Vanderbilt	90 hrs.	26	12	1	1	10				50	1 B.S.-B.A.
Tennessee	2 yrs.	2	2	2		8		18	1	33	2 Ph.C.
Meharry	2 yrs.	18	21	1	6	3		1	1	51	1 Ph.C.
Texas	60 hrs.	27	8	3	8	28	2	19	5	100	2 Ph.G.; 1 A.B.-A.M.
Baylor	2 yrs.	9	21	7	9	35	4	19	8	112	1 Ph.C.-B.S.; 1 B.E.E.; 2 A.B.-M.S.; 1 Ph.C.; 1 Ph.G.; 1 Degree Gen. Eng.
Utah	3 yrs.	13	2	1	4	14				34	1 B.S.-M.A.
Vermont	2 yrs.	6	4	3	1	19	1	8		42	3 Ph.B.
Virginia	2 yrs.	8	17		6	23	1	14		69	
Med. Coll. of Va	60 hrs.	21	18		1	13	5	5	8	71	
West Virginia	60 hrs.	15	5	4	1	32	4	7	3	71	2 A.B.-M.S.; 1 Ph.G.; 1 Ph.C.
Wisconsin	2 yrs.	28	4	2	8	51	2	11	1	107	1 Ph.B.; 1 A.B.-M.A.
Marquette	64 hrs.	10	18			16	2	30	16	92	
TOTALS		1764	1264	213	252	1345	297	767	247	6151	

NOTE: Twenty-seven schools did not have any students with less than 3 years of college work although the published entrance requirements of 53 schools are less than 3 years of college work.

portunity for the exception which is still "within the law."

It is true, no doubt, that some students are of the opinion that the offer of more years of premedical preparation increases chances of being accepted, but some extremely interesting findings on this point were presented in the study of student accomplishment, published in the JOURNAL, November, 1933, p. 331. Likewise, the study of applicants has shown that many of the "multiples" were of this opinion, but failed to reap the ex-

SUMMARY OF ENTRANCE CREDENTIALS OF CLASS OF 1933.



pected or desired reward. They not only failed of acceptance in one year but in two successive years. Hence, "more" preparation is not the sine qua non; it is "better" preparation on which insistence should be laid.

However, it is not the purpose of this study to discuss probabilities of this nature and kind, but to present the data derived by it from the material presented.

Table 1 presents the data on the entrance credentials, by schools, of the freshman class of 1932. The published admission requirements of these schools is also shown. Each column in the table is self-explanatory. The rubric following the column headed "Total," sets forth the "other degrees" appearing numerically only in the third division of the column headed "Degrees."

Table 2 presents a summary, in percentages only, of table 1.

TABLE 2. SUMMARY OF ALL MATRICULANTS IN PERCENTAGES

2 and 2+ years	16.5%
3 and 3+ years	26.6%
4 years or more	4.1%
A.B.	28.6%
B.S.	20.5%
Others	3.4%

SUMMARY

No degree	47.2%
Degrees	52.6%

TOTALS ... 1764 | 1264 | 213 | 252 | 1345 | 297 | 767 | 247 | 6161

NOTE: Twenty-seven schools did not have any students with less than 3 years of college work although the published entrance requirements of 23 schools are less than 3 years of college work.

Table 3, which is a summary of the "other" degrees offered for admission, is interesting, in the main, only because of the small number of such degrees, 213, out of a total of 6,151 matriculants.

TABLE 3. DEGREES OTHER THAN A.B. AND B.S.

A.B.—M.A.	14	A.B.—M.A.—Ph.D.	1
Ph.B.	61	A.B.—B.Mus.	1
Ph.C.—B.S.	9	Dr. Pharmacy	1
Ph.G.	33	Ph.G.—B.S.	2
B.S.—M.S.	13	A.B.—M.S.—Sc.D.	1
A.B.—M.S.	17	Ch.E.	1
Ph.C.	11	B. Che. E.	1
A.B.—B.S.	4	D.M.D.	2
B.S.—M.A.	5	B.S.—D.V.M.—M.A.	1
D.D.S.	3	A.B.—Ph.C.—B.S.	1
Ph.G.—Ph.C.	3	Ed. B.	1
A.B.—Ph.G.	2	B.P.E.	2
A.B.—D.D.S.	2	Litt. B.	1
A.B.—L.L.B.	1	B.T.E.	1
B.S.E.	1	D.D.S.—B.S.D.	1
B.S.Ch.E.	1	L.L.B.	1
Ph.C.—B.S.—Ph.G.	1	A.M.	1
E.E.	1	R.N.	1
B.S.—D.D.S.	1	V.M.D.	1
B.S.S.	1	B.P.E.—B.S.	1
L.A.B.	1	B.E.E.	1
B.S.—Ph.D.	1	Deg. Geol. Eng.	1
B.S.—Ph.B.	1		
A.B.—Ph.D.	1	Total	213

The largest number of such degrees, 61, representing the Ph.B. group, is easily explainable by reason of the fact that it is, in reality, the A.B., which certain colleges do not award, preferring the Ph.B.

Often the question is asked, "How many American students study in the Canadian medical schools?" Table 4 answers this query. Less than 15 per cent of the medical students of Canada are of American origin, that is, come from the United States. The number is small, 74, and only 59 of these can properly be charged to the United States, the remainder, 15, having obtained all, or a part, of their training in college in Canada.

TABLE 4. MATRICULATION IN CANADIAN MEDICAL SCHOOLS—1932

Alberta	22	1 from U.S.A.
Manitoba	50	0 from U.S.A.
Dalhousie	35	14 from U.S.A.
Toronto	146	2 from U.S.A.
Queens	50	3 from U.S.A.
Western Ontario	39	4 from U.S.A.
McGill	104	48 from U.S.A.
(3 repeaters, 2 from U.S.A. Repeaters from U.S. educated in U.S.A.)		
Montreal	53	3 from U.S.A.
Laval	58	2 from U.S.A.
Saskatchewan	21	0 from U.S.A.

Total: 578 students; 77 from U.S.A.

Of these 77:

59 received all their education in the U. S. A.; 12 received part of their college work in Canada; 4 received their college work in Canada; 2 received all their education in Canada.

It will be noted that only two of the medical schools of Canada have an appreciable number of students from the States, namely, McGill and Toronto. They are, also, the largest of the Canadian schools, are situated geographically close to the States and are of greater repute than other schools in Canada because of their longer establishment. This is especially true of McGill, many of whose graduates have come to the States to practice and have made professional reputations which have, no doubt, tended to attract students to this school. It has been asserted more than once that about 25 per cent of the graduates of McGill come to the States. Whether that assertion is true now cannot be defended at this time.

Table 5 sets forth the entrance requirements of all medical schools, the requirements of the state supported schools being shown in table 6.

It is apparent from these tables that by far the greatest number of schools publish a requirement of less than 3 years of college work, although many of these schools actually do not accept any student who presents less

TABLE 5. ENTRANCE REQUIREMENTS OF ALL MEDICAL SCHOOLS.

60 hrs.	46	59.7%
62 hrs.	2	2.6%
64 hrs.	1	1.3%
65 hrs.	1	1.3%
70 hrs.	2	2.6%
72 hrs.	1	1.3%
85 hrs.	1	1.3%
86 hrs.	1	1.3%
90 hrs.	21	27.2%
Degree	1	1.3%

than 3 years of college credit. The reason for this is, of course, the fact that the number of applicants is large, about twice as large as the freshman class of any year since 1905, and medical schools endeavor to select from

TABLE 6. ENTRANCE REQUIREMENTS OF STATE UNIVERSITY MEDICAL SCHOOLS

60 hours	22	73.3%
62 hours	2	6.6%
65 hours	1	3.3%
70 hours	1	3.3%
90 hours	4	13.3%

these the students who in their opinion have the best preparation. Some state supported schools have in the past year or two made a determined effort to restrict their student body to residents of the state; in fact, a few schools take only residents; therefore, many of their students come with only the required two years of preparation. They are, however, selected with care to insure adequate preparation.

NOTE: Four hundred and thirteen (413) of the first time accepted applicants with only 2 years of premedical preparation are registered in the state university medical schools; 89 with 2 years plus, or a total of 502 with less than 3 years of preparation. This is 50 per cent of the total registration for this group of matriculants.

Tables 7 and 8 present a composite picture of the results of the five years during which this study was made. The data are given both in figures and percentages for purposes of comparison. They do not require any explanation. Some of the data presented are discussed briefly at the beginning of this report.

TABLE 7. COMPARATIVE SUMMARY OF ENTRANCE CREDENTIALS PRESENTED BY STUDENTS ENTERING MEDICAL SCHOOLS IN 1928, 1929, 1930, 1931 AND 1932.

Year	No. Students	2 yrs.	3 yrs.	4 yrs.	Degrees A.B.	Degrees B.S.	Degrees Others	Total
1928	5,950	1,363	1,830	247	1,331	983	196	2,510
		22.9%	30.7%	4.2%	22.3%	16.5%	3.3%	42.2%
1929	6,359	1,462	1,752	265	1,613	1,090	186	2,889
		23.1%	27.5%	4.1%	25.3%	17.1%	2.9%	45.2%
1930	6,645	1,296	1,850	296	1,723	1,339	141	3,203
		19.5%	27.8%	4.4%	25.3%	20.1%	2.1%	47.5%
1931	6,074	1,157	1,609	166	1,645	1,285	212	3,142
		19.0%	26.5%	2.7%	27.0%	21.2%	3.5%	51.1%
1932	6,151	1,014	1,642	252	1,764	1,264	213	3,241
		16.5%	26.6%	4.1%	28.6%	20.5%	3.4%	52.7%

TABLE 8. SUMMARY BY PERCENTAGES OF ENTRANCE CREDENTIALS OF CLASSES OF 1928, 1929, 1930, 1931 AND 1932.

Year	No. Stud.	Years 2	Years 3	Years 4	Degrees A.B.	Degrees B.S.	Degrees Others	Summary No Deg.	Summary Degree
1928	5,950	22.9	30.7	4.2	22.3	16.5	3.3	57.8	42.1
1929	6,359	23.1	27.5	4.1	25.3	17.1	2.9	54.7	45.3
1930	6,645	19.5	27.8	4.4	25.3	20.1	2.1	51.7	47.5
1931	6,074	19.0	26.5	2.7	27.0	21.2	3.5	48.2	51.7
1932	6,151	16.5	26.6	4.1	28.6	20.5	3.4	47.2	52.6

In table 9 are presented the data on the women students. In the main, it makes it clear that the women applicants come with a much better preparation than the men students. Of the women, 38.7 per cent did not have

TABLE 9. NUMBER OF WOMEN MATRICULANTS IN 1932.

Total—303 ..... 4.9% (6151) of all matriculants

2 yrs.	34	11.2	15.1	38.7%
2+	12	3.9		
3 yrs.	42	13.8	17.7	
3+	12	3.9		
4 yrs.	18	5.9	5.9	
A. B.	133	43.9		61.1%
B. S.	51	16.9		
Ph. B.	1	.3		

a degree, against 47.2 per cent of the men; 61.1 per cent of the women had a degree, against 52.6 per cent of the men. However, it should be pointed out that the data of the men include the figures on the women, but the number of women students is so small that to separate them from the men would not change the results appreciably.

Many other interesting features in these tables could be emphasized for contemplation and discussion, but readers will, no doubt, make a selection of their own, based on individual preference for points presented. It is planned not to continue this study for the present school year as it is felt that it has served its purpose, for the time being at least. It may be desirable to resume it at a latter time.*

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*These credentials studies have been made possible through the courtesy of the Council on Medical Education and Hospitals of the American Medical Association by offering the use of the students' biographical record blanks prepared by the individual students and sent in by the medical schools to be filed as a part of the future practitioner's biographical record.

The previous studies were published in the JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES, July, 1929, p. 243; July, 1930, p. 231; July, 1931, p. 211; January, 1933, p. 40.

S-O-S

The copy for the revised edition of the pamphlet entitled "Fellowships, Funds and Prizes for Graduates in Medicine in the United States and Canada" which was authorized by the Association at its annual meeting is now being submitted to the various agencies represented in the first edition, and others established since, for correction. One hundred and forty-six foundations, funds, medical schools, societies, institutes, etc., are represented in this pamphlet. Record has been kept of funds established since the publication of the first edition of the pamphlet in 1930, but it is quite likely that some of these have escaped notice. Therefore, every reader of the JOURNAL who has any knowledge of any opportunity offered to the medical graduate for research in some field in medicine, including the sciences fundamental to medicine, is requested to make it known to the office of this Association, 5 South Wabash Avenue, Chicago, Illinois.

Manufacturers of drugs and foods have, in times past, offered financial rewards for special research in some subject in which they have a direct scientific interest. Many of them are included in the present pamphlet, but some are not. They should be so included. Omissions must be charged to lack of information, not to wilful intent. This is also true of the special funds and prizes offered by scientific and professional societies.

Thus far this pamphlet has offered the most complete information in this field ever published. The second edition should not fall behind. Therefore, the assistance and cooperation of every reader of the JOURNAL is needed to achieve the desired result. Copies of the pamphlet may be obtained by writing to this office or to the Rockefeller Foundation, 49 West 49th Street, New York City.

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 9 JANUARY, 1934 Number 1

College and University Teaching

A most auspicious report on college and university teaching has recently been issued by the American Association of University Professors. This report states at the very outset: "The purpose of college teaching is to induce self-propelled intellectual activity on the part of the student. Accordingly a frank recognition of this principle of self-education under guidance will suggest a sufficient definition of good teaching. To teach effectively is to lead, to inspire, and to guide the learner. Any technique or device that serves these ends is a good device.

"Hence the most important question to ask about the teacher is: Does he interest and inspire his students to the extent of getting them to work hard for themselves? In order to attain this end a great variety of technique are equally available from which the teacher may choose. In any discussion of the methods whereby college teaching can be improved it is imperative that the end, as well as the means, be kept to the forefront. No additional method or device can be of real service to the teacher unless its use induces the student to do better work on his own account. This ought to be axiomatic but in educational discussions it is sometimes overlooked. The end is lost to view in controversies over technique and methods. In achieving this end, moreover, the general spirit and temper of an educational institution is of the highest importance as a means of reinforcing the instruction."

This report is based upon a study of educational practice in educational institutions in all sections of the country. The report is a generalization and appraisal of this practice and an attempt to discuss the practical philosophy of college teaching, its relationship to research, the types of criteria that may be applied to it, the teacher's responsibility for self-improvement and for the educational policies of the institution that he represents, the effect of nonteaching activities upon teaching, the sectioning of classes on the basis of ability or achievement, use of comprehensive examinations, and other devices intended to help teaching.

The committee in charge of this report is of the opinion that much can be accomplished for the promotion of better teaching if college administrators will encourage departments to make a self-study of their own work. The committee also manifests deep interest in new methods of instruction that are being advocated in college circles generally and suggests that a subcommittee on the improvement of instruction might very well undertake an analysis and appraisal of these methods. Especially is the committee interested in those methods of instruction which throw more of the responsibility of his education upon the student himself. It is a fact that during the last two decades emphasis in college teaching has been moving steadily toward greater individualizing of instruction. That is, more and more responsibility has been placed upon the individual student. The new devices such as independent study courses, honor courses, preceptorial and tutorial systems, conference plans, free periods for reading and the like—all emphasize this tendency. All these had their

origin in a belief that the regular routine of classroom work does not provide a sufficient challenge for the best students and that even for students of lesser ability there should be some adaptation of college work to their individual needs and abilities.

The committee still further urges that experimentation of the teaching processes be encouraged and that it be carried on under such controlled conditions as will permit of a careful examination of the experiments themselves.

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Too Many Physicians

Recent discussions of the question "Are there too many physicians?" do not seem to have yielded a satisfactory answer. Nor does the echo appear to have reached those persons who have in mind entering the medical profession. The usual rush to get into a medical school prevailed during 1933 as in the previous years. There has not been more than a barely perceptible reduction either in the number of applicants nor in the number of applications made, although premedical preparation is of longer duration than in any previous year, probably due to the fact that the applicant feels that he is increasing his chances of being accepted by offering more years of preparation.

Since 1915 the curve has in all respects been steadily upward, with only very slight variation, as the following figures show:

GRADUATES

YEAR	NO. COLLEGES	NUMBER
1905	160 colleges	5,606
1915	96 colleges	3,536
1920	85 colleges	3,407
1922	81 colleges	2,520
1925	80 colleges	3,974
1930	76 colleges	4,565
1931	76 colleges	4,735
1932	76 colleges	4,936
1933	77 colleges	4,895

The peak year was 1905, virtually the last year of existence of the proprietary schools. The smallest graduating class, in 1922, was due to the war, this class having entered medical schools in 1918. Since then the curve has gone up, although 1933 showed a slight reduction from 1932.

MEDICAL STUDENTS

YEAR	NUMBER
1905	26,147
1920	13,798
1925	18,200
1930	21,597
1931	21,982
1932	22,135
1933	22,466

Here, again is reflected the passing of the proprietary school, and the effect of the war but, since 1920, the number of medical students has steadily increased, although still far behind the peak year, 1905.

FRESHMAN STUDENTS

YEAR	NUMBER	OUT AT END OF YEAR	
1930	6,315	826	14.2 per cent
1931	6,097	800	13.1 per cent
1932	6,457	912	14.1 per cent

These being the "depression" years, the figures given are rather significant. The worst year of this period, 1932, had the largest freshman class of the three. The depression did not abate the desire to become a member of an already greatly over-crowded and far from lucrative profession.

Lack of definite data on how many members of each entering class graduate makes it impossible to make any positive statement or to present figures. However, independent unpublished studies have shown that 25 per cent is a fair average. Published studies have shown that nearly 15 per cent drop out at the end of the first year for one reason or another, mostly on account of poor scholarship. About 6 or 7 per cent drop out at the end of the second year; about 2 per cent at the end of the third year and probably not more than 1 per cent at the end of the fourth year. Other studies

have shown that another 25 per cent drop out of the practice of medicine within ten years after graduation, either by death (a small number) or for other reasons.

At any rate, these figures afford much opportunity for thought even though they do not answer the question "Are there too many physicians?"

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Central Midwifery School in China

The Board of Midwifery Education of China, organized jointly by the Ministry of Education and the National Health Administration, has established a Central Midwifery School in Nanking. The enrollment will be limited to 30 students.

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Grants Available for Research

The Committee on Scientific Research of the American Medical Association invites applications for grants in aid of research on problems bearing on the clinical aspects of medicine and surgery. Inquiries may be addressed to the committee at 535 North Dearborn Street, Chicago.

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Research on Goiter

The American Association for the Study of Goiter, for the fifth time, offers $300 as a first award, and two honorable mentions for the best essays based on original research work on any phase of goiter to be presented at its annual meeting to be held in Cleveland, Ohio, June 7-9, 1934.

Competing manuscripts must be in English, and submitted to the corresponding secretary, Dr. J. R. Yung, 670 Cherry Street, Terra Haute, Indiana, not later than April 1, 1934. Manuscripts received after this date will be held for the next year or returned at the author's request.

Study of Applicants

This study, in the second year of its revival, is not ready for publication, many reports having been received late. However, the material on hand, and the point to which it has been worked up, offers opportunities to the medical schools to secure much valuable information.

For instance: it can be helpful to the committees on admission of the medical schools by furnishing information as to whether applicants have applied in previous years and what has been their fate. Many of the multiple applicants have been such in both years of the study, and the results often have been disastrous to the candidate. Others have finally succeeded in gaining admission, perhaps because of further preparation or having made a better record in college the intervening year than the first year of application. Other reasons than this one may have been responsible. This information would be helpful to admitting officers.

Medical schools could also secure information on the members of the freshman class by sending in a list of the class and learning whether these students had made application to other schools and what had happened. For instance, one applicant may have made as many as twenty-five applications and been accepted by only one school, most of the rejections having been made because of poor scholarship. Such a student can be watched carefully during his freshman year, and through skillful guidance, by a specially appointed advisor, turn out to be a very desirable student. On the other hand, it may be possible to discover his lack of aptitude for medicine early in the year and his withdrawal from the school requested. Several schools have already secured this information.

This study carries a mine of information on many points. Use should be made of it to good purpose.

College News

University of Louisville School of Medicine

An addition, at a cost of $230,000 is to be built. The plans for the addition have been approved by the Public Works Administration which will supply the funds. They also call for extensive remodeling of the present building and the tearing down of the Administration building adjoining the school.

The new building is to be connected with the old one through hallways to each floor. Important innovations to be brought about are the installing of private laboratories for each of the professors, the installation of a new lighting system in the gross anatomy laboratory, the building of a small animal room, within easy access of the power elevator, on each floor for each department and the increasing of space for the library.

The basement of the new school will contain a new power plant, a library work room and stack room, a frog room and rooms for storage, laundry and pickling.

The first floor is to house the offices of the dean and registrar, student rest and locker rooms, the library and the chemistry department. The library will be divided into a reading room, with a capacity of four thousand volumes, and a stack room with a capacity of twenty-five thousand books. The chemistry department, which is to occupy most of the first floor wing of the new addition, will have a student's laboratory, two research laboratories, lecture rooms and a chemistry library. Plans also call for a museum on the first floor.

The department of physiology, pharmacology and biophysics are to utilize the second floor. In addition to the student and research laboratories there are to be the library, stock room, rooms for dogs and small animals, lectures, x-rays, operations and a large shop.

The third floor will accommodate the departments of bacteriology, pathology and public health. Besides the laboratories and the library, this floor will have special rooms for incubators, tissue culture, dental pathology, bacteriology and a pathological museum. The office of the secretary will also be located on this floor.

The anatomy department will occupy the entire fourth floor and many changes are contemplated in the present set up. The histology, embryology, and gross anatomy laboratories, a library, offices for faculty members, an animal room, and rooms for lectures, gross storage, chart making, photography and a students' wash room are to be added. A new feature of the department will be the provision of separate dissecting rooms for the dental and medical students.

The library system is to be made more convenient and will be greatly modernized. The department libraries on each floor will be situated directly above the main library on the first floor and they will be connected by a "dumb waiter."

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New York University University and Bellevue Hospital Medical College

Dr. Warren Coleman, who has served in the department of medicine for fifteen years, was made professor emeritus of clinical medicine.

Appointments: Drs. Mills Sturtevant, professor of clinical medicine; Robert P. Wadhams, professor of clinical surgery; Norman Jolliffe, assistant professor of clinical medicine; Currier McEwen, assistant professor of medicine; Paul E. Bechet, assistant clinical professor of

dermatology and syphilology; J. Winston Fowlkes, assistant clinical professor of otorhinolaryngology; John W. Hammond, assistant clinical professor of pediatrics; Thomas E. Lavell and Sophia J. Kleegman, assistant clinical professors of gynecology; Oswald LaRotonda, assistast clinical professor of medicine; Samuel M. Peck, assistant clinical professor of dermatology and syphilology.

Following the death of Dr. Richard T. Atkins, professor of otorhinolaryngology, Dr. Wesley C. Bowers was appointed acting head of the department.

The following gifts for research and other purposes have been announced: For the Cardiac Clinic Endowment Fund, $22,750; for the Neurological Research Laboratory, $10,000; for vitamin research, $2,000; for research in pneumonia, $2,400; for experimental work on liver extract, $1,250; for research on infantile paralysis, $1,000; for the college, $8,750; for retiring allowances, $10,100.

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Johns Hopkins University School of Medicine

Dr. Philip Bard has been appointed professor of physiology to succeed Dr. E. K. Marshall who has been appointed professor of pharmacology, succeeding Dr. Abel, resigned.

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Columbia University College of Physicians and Surgeons

Graduate work in surgery is being offered under Dr. Allen O. Whipple, professor of surgery. This work is in the form of fellowships. Six junior fellows are appointed annually. They are chosen from qualified candidates who have had a surgical internship and who are desirous of demonstrating their qualifications for a senior fellowship. They are chosen because of their record as surgical interns and because of their interest in investigative work, both clinical and experimental. From this group two senior fellows are chosen annually for a period of two or three years, and during this period they are given increasingly major surgery, are assisted by senior attending surgeons, and are given responsibility and postoperative care of patients.

If the senior fellows have done satisfactory work, they may be given a degree in Columbia University for graduate studies in surgery.

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Meharry Medical College

Dr. William H. Grant, who has completed two years of graduate work in the University of Minnesota, has been appointed associate professor of bacteriology. Dr. Grant is a graduate of Meharry.

Dr. William A. Mason, also a Meharry graduate, has joined the staff of the outpatient department.

Dr. J. H. Hale, professor of surgery and supervisor of dispensaries, has been chosen president-elect of the National Medical Association.

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Ohio State University College of Medicine

The one hundredth anniversary of the college will be celebrated March 3, 1934. Plans are under way for a reunion of graduates of the various schools which have been merged through the century to form the present medical school. The college is the successor of five earlier schools. The first was Willoughby Medical College, founded at Willoughby, March 3, 1834. Later it moved to Columbus and continued until 1848, when it became Starling Medical College. In 1892 Starling absorbed the Columbus Medical College, founded in 1875, and in 1907 Starling merged with Ohio Medical University to form Starling-Ohio Medical College. The school was operated under that name until 1914, when the College of Medicine, Ohio State University, was founded and absorbed the property and the staff of the Starling-Ohio Medical College.

St. Louis University
School of Medicine

Dr. W. H. Vogt has been appointed professor and director of the department of gynecology. Dr. Edgar F. Schmitz was appointed associate professor and Dr. E. Lee Dorsett assistant professor in the department.

Dr. Julius H. Gross was appointed assistant professor of ophthalmology. Dr. James Archer O'Reilly was appointed associate professor of orthopedics; Dr. Fred Mettler, instructor in physiology.

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University of South Dakota
School of Medicine

Dr. J. C. Ohlmacher, professor of pathology and bacteriology, has been appointed acting dean, succeeding Dr. A. Pohlman, now professor of anatomy in Creighton University Medical College.

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College of Medical Evangelists

The Colver lectures for 1933-1934, sponsored by the college, were delivered by Dr. William Boyd, professor of pathology in the University of Manitoba, December 18 and 19. His subjects were Bacterial Infections of the Heart and Tumors of the Neck.

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Baylor University
School of Medicine

The second malaria microscopy school was conducted December 20-21, under the supervision of Drs. Walter H. Moursund, dean; Hardy A. Kemp, associate professor of bacteriology; John W. Brown, state health officer; Charles D. Reece, state epidemiologist, and Charles P. Coogle, malariologist of the U. S. Public Health Service, and others.

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University of Nebraska
College of Medicine

The department of physiology and pharmacology has received from the Frederick Stearns Company a grant of $1,800 which is to be used in the investigation of physiological effects of certain pharmaceuticals. The work is under the charge of Dr. A. R. McIntyre, professor of pharmacology at the college, and Dr. E. L. MacQuiddy of the department of internal medicine.

The Board of Regents recently appointed Dr. J. Jay Keegan to the chairmanship of the department of surgery to fill the vacancy left by the death of Dr. B. B. Davis.

Dr. Rodney W. Bliss has been appointed acting chairman of the department of internal medicine supplying the place formerly filled by Dr. E. L. Bridges.

Dr. Richard Lucke has resigned from the internal medicine department and has accepted a position with the Research Department of the Abbott Company of Chicago.

Dr. Meyer Beber, assistant professor in the department of biochemistry, has resigned to accept an appointment in St. Elizabeth's Hospital, Washington, D. C. Dr. E. E. Dunn, who received his Doctorate from the University of Cincinnati, was appointed to fill the vacancy resulting from the resignation of Dr. Beber.

Dr. Richard Young, who has just completed a service under Dr. Adolf Meyer at Johns Hopkins, has been appointed to the department of neuropsychiatry.

Dr. Dewey Bisgard, recently engaged in postgraduate work under Dr. D. B. Phemister of the University of Chicago, has been appointed to the department of surgery in the division of fractures.

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Syracuse University
College of Medicine

The department of obstetrics in the University Hospital has been discontinued in order to concentrate all of the work of this department in Syracuse Memorial Hospital which has for many years been affiliated with the College of Medicine for teaching purposes. This action was taken in connection with the policy of the school's affiliated hospitals

in avoiding duplication in connection with their cooperative development.

Under a grant of $2,500 from the Josiah Macy, Jr. Foundation, there is being continued an experiment in the use of the social case method in the teaching of medicine.

In 1934 the college will celebrate its one hundredth anniversary, the college having been founded as Geneva Medical College in Geneva, New York, in 1834. In 1872 it was transferred to Syracuse and became the College of Medicine of Syracuse University.

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University of Chicago
School of Medicine
Division of Biological Sciences

Dr. George Frederick Dick has been appointed professor and chairman of the department of medicine. Dr. Dick, whose work at the McCormick Institute for Infectious Diseases, with the collaboration of his wife, Dr. Gladys H. Dick, on scarlet fever, is internationally known, was formerly professor and chairman of the Department of Medicine in Rush Medical College. He is succeeded in Rush by Dr. Ernest E. Irons, dean of Rush Medical College.

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Harvard Medical College

Dr. Robert B. Osgood, John Band Buckminster Brown professor of orthopedic surgery, emeritus, delivered the George W. Gay lecture on medical ethics in November. His subject was the "Theology of Medicine."

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University of Virginia
Department of Medicine

At the meeting of the University Medical Society on October 9, Dr. E. P. Lehman spoke on the subject "Vasospastic Syndromes of the Extremities"; Dr. C. B. Morton spoke on "Duodenitis following Experimental Narrowing of the Pylorus."

Dr. Frederic Coutelen, lecturer in parasitology at the Institute of Colonial Medicine in Paris, visited the Medical School October 24.

October 30, Dr. F. W. Stewart, of the Memorial Hospital in New York, spoke before the University Medical Society on the subject of Hodgkin's Disease.

Dr. Johannes Bauer, of the Yellow Fever Research Laboratory of the International Health Division of the Rockefeller Foundation, visited the Medical School November 3.

October 10, Dr. Edwin Wood spoke before the Postgraduate Society of Southern Virginia at Petersburg on the subject of "Cardiac Emergencies; Genuine and Spurious."

November 13, Dr. Kenneth Maxcy spoke on "Undulant Fever" before the Medical Society of Northern Virginia at Front Royal.

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Medical College of Virginia

Founders' Day exercises of the ninety-sixth session of the college were held in Richmond, December 5. The speaker on this occasion was Dr. Douglas S. Freeman, editor of the *Richmond News Leader.*

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University of Toronto
Faculty of Medicine

Dr. A. T. Stanton, a graduate of Trinity Medical College, 1899, had the honorary degree of Doctor of Science conferred on him by the Senate of the University on November 10. Dr. Stanton is chief medical adviser to the Secretary of State for the Colonies. He has also held the position of Director of Government Laboratories in the Federated Malay States and is a Fellow of the Royal Society of Tropical Medicine and Hygiene, London, England.

Dr. Stanton was to have received this degree at the opening of the Banting Institute in 1930, but was unable to be present on that occasion, and the degree has now been conferred on him in absentia, by special statute of the Senate.

Dr. F. N. G. Starr has been appointed to the Board of Governors of the Uni-

versity to take the place of the late W. K. George.

Dr. W. J. Deadman, a graduate in medicine of the University of Toronto, 1913, has been elected to represent the graduates in medicine on the Senate of the University, in place of Dr. T. H. Middlebro, who has been compelled to resign on account of ill health. Dr. Deadman is pathologist at the Hamilton General Hospital and president of the Medical Alumni Association.

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Duke University School of Medicine

In addition to the requirements for entrance, an applicant for admission to the junior class must present evidence that he will complete successfully the first and second year curriculum in a class A medical school consisting of: Gross, microscopic and neuro-anatomy, biochemistry, pharmacology, physiology, gross and microscopic pathology, bacteriology, clinical microscopy, and normal and abnormal physical diagnosis. Students who transfer from other medical schools can be admitted only in the autumn quarter, but are required to spend the preceding summer quarter here, without tuition, studying physical diagnosis and clinical microscopy, and pass the Duke preclinical examination in September. They are eligible to receive a certificate in March or June two years later, depending upon whether they attend the intervening summer quarter. Application forms may be obtained by writing to the Dean, Duke University School of Medicine, Durham, N. C.; they are considered and a decision in regard to admission made as described for applications for admission. Students at other approved medical schools may, if recommended, transfer to Duke for one or more quarters for regular or special studies. They should write to the dean for information.

November 4 two surgical clinics were given at the Duke Hospital, by Dr. G. C. Weil, surgeon-in-chief, Mercy Hospital, Pittsburgh, on fractures of the pelvis, and by Dr. C. C. Coleman, of Richmond, Va., on fractures of the spine associated with injury of the spinal cord.

November 14, Dr. T. B. Sellers, of New Orleans, held a gynecological clinic, and Dr. E. L. King, of New Orleans, gave a clinic on the treatment of pelvic infections.

November 18, Dr. C. R. Murray, associate professor of surgery, in charge of the Bone and Joint Division, at the Columbia University College of Physicians and Surgeons and the Presbyterian Hospital Medical Center, gave a clinic on fractures, and Dr. Alexander Schaffer, of Baltimore, gave a clinic on tuberculosis in children.

December 2, Dr. J. Shelton Horsley, of Richmond, Va., gave a clinic at the Duke Hospital on Lesions of the Stomach and Colon. December 7, Dr. E. L. Eliason, of Philadelphia, Pa., gave a clinic on Fractures. December 8, Dr. Charles W. Stiles, of the United States Public Health Service, lectured on Hookworm. December 13, Dr. Estella Ford Warner, of the United States Public Health Service, lectured on Child Hygiene.

The following seniors were elected to Alpha Omega Alpha: Mrs. Eleanor B. Easley, Jay L. Hutchison and Talmage L. Peele.

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University of Cincinnati College of Medicine

Dr. Clarence Ray has been appointed professor and head of the department of ophthalmology, succeeding Dr. Victor Ray who resigned after thirty years of service.

Dr. Gordon F. McKim has been appointed professor of surgery and head of the Division of Urology, succeeding Dr. E. O. Smith who resigned because of ill health.

Dr. Frank M. Coppock has been appointed professor of surgery, division of

gynecology, succeeding the late Dr. Chas. M. Bonifield whose associate he was for many years.

PROMOTIONS: Department of ophthalmology—Drs. Charles A. Hofling and Horace Reid, from instructors to assistant professors; Drs. D. T. Vail and G. William Miller, from assistants to instructors; Dr. Louis J. Hendricks, from assistant in otolaryngology to instructor in ophthalmology.

APPOINTMENTS: Drs. Albert Brown and Clarence Hans, instructors, and Drs. Ira Abrahamson, Harry G. Nelson and M. M. Appelgate, assistants. Dr. King, appointed professor of ophthalmology, has elected for the time being at least to retain the directorship of the outpatient department for his division in addition to his other duties.

Dr. Merrick F. McCarthy, assistant professor of otolaryngology, was advanced to the rank of associate professor.

Dr. Charlotte Wiedemer Schell has been granted a leave of absence for two months from the Department of Medicine in order to devote time to research study in eastern clinics.

Among gifts announced is the sum of $25,000 from the estate of the late Mrs. Mary Hyndman providing for the establishment of "The James Gilmour Hyndman Fellowship" in preventive medicine to be awarded annually. Dr. Hyndman, who died several years ago was a professor in the college and closely identified with medical education during his entire professional life.

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Stanford University School of Medicine

The fifty-second course of six popular medical lectures will be given at Lane Hall, north side of Sacramento Street, near Webster, on alternate Friday evenings, from January 12 to March 23, 1934, at 8:00 p. m.

The topics to be discussed are: 1. The Organization of Medical and Surgical Emergencies in San Francisco, by Edmund Butler, M. D.; 2. Medicine in Community Service, by Dr. Ray Lyman Wilbur; 3. Relation of Diet to Health, by Agnes Fay Morgan, Ph. D.; 4. Occupational Therapy, by Mary C. Rixford, O. T. Reg.; 5. The Rôle of Psychiatry in Preventive Medicine, by George S. Johnson, M. D.; 6. Some Contributions of Medical Science to Our Knowledge of Pain, by Joseph C. Hinsey, Ph. D.

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University of Texas Medical Branch

During recent weeks, students in the medical branch have had the opportunity to hear messages delivered by a number of distinguished visitors.

Dr. Miranda, professor of clinical medicine in the National University of Mexico, spoke on "Endocrinology" and "Body Types."

Dr. Plass, professor of obstetrics in the State University of Iowa, spoke on "Gestational Polyneuritis."

Dr. Franklin G. Ebaugh, professor of psychiatry, University of Colorado, spoke on "Hysteria."

Dr. J. W. Harris, professor of obstetrics in the University of Wisconsin, spoke on "Puerperal Infections."

Other visitors were Dr. Campbell, professor of orthopedic surgery in the University of Tennessee, and Dr. John H. Musser, professor of medicine in the Tulane University of Louisiana School of Medicine, New Orleans.

Dr. Ernesto de Souza Campos, professor of pathology of the University of Sao Paulo, Brazil, and a group of his associates and students are making a tour of the medical schools and hospitals of this country in their trip around the world. They visited the University of Texas School of Medicine Dec. 19, 1933. They inspected the laboratory facilities, methods of teaching and class room instruction, curriculum, etc., and were tendered a luncheon at the Hotel Galvez.

Personals

Dr. Frank R. Lillie (Ph. D.), dean of the Division of Biological Sciences, University of Chicago, was recently appointed Andrew MacLeish Distinguished Service Professor in "recognition of his brilliant and fruitful service to the university."

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Dr. Harold Cummings has been appointed professor of microscopic anatomy in the School of Medicine of Tulane University of Louisiana.

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Dr. James W. Jobling, professor and chief of the department of pathology in Columbia University College of Physicians and Surgeons, delivered the November lecture of the Smith-Reed-Russell series at the George Washington University School of Medicine. The subject of the lecture was arteriosclerosis.

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Dr. Howard T. Karsner, professor and director of the Institute of Pathology of the School of Medicine of Western Reserve University, delivered the Smith-Reed-Russell lecture at the School of Medicine of George Washington University in December. His subject was rheumatic heart disease.

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Dr. G. E. Harmon, associate professor of hygiene and vital statistics of the School of Medicine of Western Reserve University, was elected chairman of the Vital Statistics Section of the American Public Health Association at its meeting recently held in Indianapolis.

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Dr. John P. Bowler, dean of Dartmouth Medical School, was recently elected president of the Association of Resident and Former Resident Physicians of the Mayo Clinic and Mayo Foundation.

A symposium on medical education was presented at Mount Sinai Hospital, New York City, November 6, by Drs. G. Canby Robinson, John H. Wyckoff and Willard C. Rappleye.

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Dr. Carl Calvin Dauer has been appointed instructor in preventive medicine in the Graduate School of Medicine of the Tulane University of Louisiana.

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Dr. Henry C. Hesseltine, instructor in obstetrics and gynecology, Division of Biological Sciences, University of Chicago, was the recipient of the annual prize of $100 granted by the Central Association of Obstetricians and Gynecologists for the most meritorious work done by one of its members. His thesis was based on a research on trichomonas vaginalis vaginitis.

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Dr. Hans Zinsser, professor of bacteriology and immunology, Harvard University Medical School, Boston, was given an honorary degree by Lehigh University.

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Robert Calvin Coffey, Portland, Ore., clinical professor of surgery at the University of Oregon Medical School, was killed November 9, in an airplane accident.

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Dr. Howard T. Karsner, director of the Institute of Pathology of Western Reserve University, delivered the first lecture on the Albert Fairchild Holden Foundation December 10, 1933. His subject was "The Rôle of Germs in Modern Life."

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Dr. Chas. H. Lawrence, Jr., has resigned as assistant professor of endocrinology in Boston University School of Medicine.

Abstracts of Current Literature

Social Aspects of Medicine in Internships

At the Beth Israel Hospital, Boston, a plan was evolved which it was hoped would meet all the needs of the patient, as well as provide training for the intern in an appreciation of the social component in medicine. The internship lasts twenty and one-half months, and is divided into five periods of four months each, plus a two weeks' vacation. The interns are given increasing responsibilities under the close supervision and guidance of the resident physician and visiting staff, in each succeeding period of four months. The gradual development of social insight on the part of the intern begins with his first period of training. The varied and closely supervised experiences of the succeeding periods constitute a preparation for the responsibility which the senior intern is given. As a result of the rotation of service, every four months, there is a change of senior interns receiving this training in the social aspects of medicine. Although there is this continuous change of interns, the resident physician remains a constant factor for two years.

The plan for this training is divided essentially into four parts: 1. The social history secured by the senior intern from the patient. 2. The diagnostic and prognostic data secured by the senior intern during the medical visit. 3. Presentation and discussion of all these factors during medical social ward rounds. 4. Subsequent discussion of selected problems by the intern and social worker with a member of the visiting staff on service. The plan has provided for an orderly method of "refer" of patients to the social worker, and has served an additional and equally important purpose in the training of interns in the social component of medicine.—H. A. DEROW AND E. COHEN: *New England J. Med.*, Oct. 26, 1933.

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Need of Classical Training for Physicians

A bill demanding for admission to the facultés de médecine, the possession of the type of baccalaureate degree that includes Greek and Latin studies, would tend to limit the number of medical students, eliminating those who have had only a purely scientific training, and also many foreign students. The project would indirectly diminish the crowding of the facultés de médecine. The bill has been passed by the senate but not as yet by the chamber of deputies, in which a new majority, influenced by socialism, has no sympathy for classical culture and is inclined rather to open the way to higher education to the masses who have not as thorough an education and among whom Latin, especially, is regarded as associated with the conservation of the Roman Catholic faith.

With the intention, no doubt, of exerting pressure on the sentiments of the new chamber of deputies, which will soon convene, many meetings have been held in favor of Greek and Latin studies as a necessary preparation for the study of medicine. One meeting, which was particularly important, was a public debate, held under the chairmanship of Professor Lépine, dean of the Faculté de médecine de Lyon. Professor Rist upheld the need of a knowledge of Latin, which was the forerunner of French, but Greek he would leave an optional study. Professor Sergent called attention to the abundance of medical terms derived from Greek roots and emphasizing the great value of Greek roots in forming new medical terms, since a single compound

word often takes the place of a long definition. In his opinion, if the physicians approved the suppression of the Greek, the politicians would not hesitate to follow with the abolition of the Latin.

Mr. Armbruster, Mr. Blum, professor at the university, and Dr. Cibrié, secretary of the Union des syndicats médicaux and a delegate of the Société corporative des étudiants en médecine, spoke along the same lines and demanded for the physician the highest intellectual culture possible, in order that he might contend against the moral weakening of the profession in the midst of the so-called realist spirit (but in reality a material and commercial spirit) of the present day.

Shortly after this meeting, which appeared to influence public sentiment to a certain extent, the alumni association of the lycées of France and the colonies held its annual meeting at Rochelle. A similar debate was held, and the meeting pronounced unanimously in favor of making Latin and Greek compulsory requirements for admission to the study of medicine—PARIS LETTER, *J. A. M. A.*, July 9, 1932.

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Selection of Medical Students

Prof. B. Boucek of Brno collected recently some interesting figures in Czechoslovakia on medical education, which show a continuous increase in the number of medical students since 1926. The present number of medical students (over 6,000) was never reached before. He also traced the number of teachers and assistants at the medical schools and found that the teaching personnel had not increased correspondingly. This is more serious because the amount of teaching that must be presented to students is increasing rapidly. Professor Boucek followed further the progress of students during their stay at the medical school. He found that on the average there is one graduation a year among from seven to ten medical students. Only 15 per cent of the students pass the first examinations in the prescribed term. In his opinion, this is due to lack of care in selecting the students before they are admitted. In spite of this slow progress in their studies, the number of those who graduate is far above the actual demands of medical practice. At the present rate of about 500 new graduates a year all possible openings for medical practice in Czechoslovakia will soon be filled, and a further increase in practitioners will lead to a lowering of the standard of living among physicians. It would be rational to estimate from time to time how many new medical students should be admitted to the medical schools according to the actual demand of medical practice. The medical students should be divided among medical schools according to their teaching capacity. A special examination should be required before the admission of medical students, because a bachelor's degree, which is required, does not always qualify students for the study of medicine.—Prague Letter, Sept. 27, 1933. —*J. A. M. A.*, Oct. 28, 1933.

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Hospital Intern Training

In these times of uncertainty and changing social and economic conditions, it is highly important that the young man about to enter the practice of medicine be given every possible opportunity to fortify himself with as much information as possible concerning some of the problems he is destined to run up against during his professional career.

There is probably no better proving ground for the medical graduate or a better opportunity for him to learn through experience and from the counsel of experienced heads in medical practice than the hospital internship which most medical graduates enter upon completion of their academic work.

Some of the points worthy of considera-

tion by the practicing profession and hospital administrators with regard to the internship question were discussed recently by one hospital authority, quotations from which follow:

"The psychology of the intern represents a curious mixture of student unsophistication and half matured professionalism.

"Frolicsome, schoolboyish, hypersensitive, petulant, enthusiastic, cooperative, hesitating and self-confident are terms that accurately describe the varying moods of the intern. He has crowded his memory with facts and figures concerning human pathology and symptomatology and yet he has not learned to apply his knowledge practically. He is inclined to pity the aging physician who knows how to employ so few drugs. He has preconceived notions as to the proper conduct of hospitals, and does not hesitate to voice them. This is the type of personality which each year enters the hospitals to assist in caring for the sick.

"That the intern needs a gentle but firm hand to guide his course should be self-evident. But in many hospitals, the presentation of a book of rules and a service sheet, all but represents this most important and understanding tutelage. No careful instructions as to his newly acquired responsibilities—no sympathetic mentor to guide him through his first few days—no one to demonstrate that major operation, for him at least, of taking a blood specimen for a chemical study—no one but the intern who preceded him on the service from whom to receive advice as to his new work. Staff members are inclined to be hurried and exacting—to be unable or unwilling to teach—and nurses irritate in endeavoring to impart information. Little wonder that the first few weeks of an intern's hospital life are filled with many misunderstandings.

"The hospital, therefore, is often to blame when unsatisfactory service is rendered by the intern. An absence of understanding of the psychology and the practical fundamental abilities of the recent graduate in medicine, a lack of system in instructing him during his first few weeks in the hospital and an absence of evident respect for his professional standing are strong enough influences to ruin the many other possibilities that he possesses for future usefulness to the sick. The coming of the new intern is an event fraught with promise, or with possibilities for lost opportunities for service to the sick."—*Ohio State M. J.*, January, 1934, p. 20.

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The Art of Examination

The principle of a general examination was introduced into the Harvard Medical School in 1910. It went through different forms, and several years passed before a series of experiments showed how it had best be used. In its definitive shape it is truly general. It is obligatory for all students at the end of the four years' course, and covers all the subjects studied both in the laboratory and the clinics. It is, of course, a measurement, but that is not its chief aim; and, in fact, the proportion of failures is very small. For a time its nature was not understood, and some of the faculty seemed to consider its purpose a review for the assigning of marks; but its real object is quite different, that of requiring a correlation between the various subjects included in the whole four years' course. In medicine this is peculiarly difficult because, studied separately, the relations between them are not easily grasped. The connection between anatomy, chemistry, the diagnosis and treatment of disease, and the curative processes of surgery are not at the outset obvious to the student, or always so taught as to make them so. The art of medicine deals with man as a complete, self-consistent organism, and the art of the general examination is to cause the student to regard it as such. For this purpose the questions are not special but

comprehensive, each calling forth the bearing of different subjects on one another. Let me repeat, the essential thing about this examination is not the measurement in itself, but the attitude it engenders; and although nothing accomplishes its end perfectly, it has had a notable effect in causing the students to reflect upon medicine as a whole, as well as an influence on the teaching of diverse subjects.

Every examination, whose nature is known, set at the close of a period of study upon the subjects studied, will affect the attitude of the students toward those subjects for good or evil, becoming to that extent an integral part of the process of education; and the more it is considered by the examiners from this point of view the better its effect is likely to be. . . .

The end sought by education is enlarging and refining the mind of the student, inducing keen perception, correct reasoning, and above all an appetite for knowledge and thought for their own sake which will not vanish, but once acquired is well-nigh insatiate, unquenchable, and capable of being turned in many directions. Examinations consciously treated as a part of the educational process are more likely to promote that purpose.

Education is a vast and complex thing of which we have learned something by experience, by theory not very much; and verily the art of examination is difficult, for it aims at several distinct objects at once. These things are not to be solved by a formula, nor are any formulae either exact or essential, for there may be many roads to the same end. But one matter that has not yet received the attention it deserves, and is well worth study, is that of examinations as a vital factor in the educational process.—A. LAWRENCE LOWELL: *The Technology Review*, vol. XXXV, No. 9.

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Legislation in Massachusetts

The Massachusetts Board of Registration in medicine has again introduced a bill which will, if enacted, give the Board some power of approval of medical schools from which it receives applicants for examination. The bill differs from that introduced last year in that it requires two years of college work before admission to a medical school; it requires that the candidate shall complete satisfactorily his medical course instead of spending four years of mere attendance; and it makes explicitly eligible the graduates of some high-grade foreign schools, the curricula of which are not arranged in four years of thirty-two weeks each, but which, with five or six years of fewer weeks may be considered equivalent to the approved course in the United States. It also makes explicitly eligible the candidates from schools in this country which have the four quarter system.—*New England J. of M.*, Dec. 28, 1933, p. 1366.

Book News

Diseases of the Heart

By Sir Thomas Lewis, London. The MacMillan Company, New York. 1933. Price, $3.50.

The continually increasing importance of diseases of the heart as a clinical entity makes it mandatory that the student be provided with a book which is authoritative, readable and comprehensive in this field. The author is well known as an authority on heart disease. In this book he presents his experience clearly yet briefly. The text is replete with invaluable suggestions for the proper management of heart disease. It is packed with good sound clinical facts and deserves to be ranked as a classic in this field.

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A Textbook of Neuropathology

By Arthur Weil, M. D., Associate Professor of Neuropathology, Northwestern University Medical School. Lea and Febiger, Philadelphia. 1933. Price, $5.00.

Neurology is now recognized as a separate unit of the medical sciences. So rapid has been its growth that there is a demand for textbooks in each of its fundamental branches. This work admirably meets that need in neuropathology, separating it from the clinical teaching of neurology. It provides a review of the subject covering every recent advance, it summarizes the facts hitherto scattered throughout the literature, it gives a better understanding of the reaction of the nervous system in disease and it is a reliable guide in all clinical work. It provides the neurologist with a reliable collection of data and it indicates the many problems in the etiology of disease which remain to be solved.

This book does not confine itself to the aid of the microscope. Every other tool which modern biology provides is also utilized. A chapter on staining methods is included to give a more complete understanding of the technique used in producing the slides from which the photomicrographs are made. The final chapter contains a list of the more recent monographs on the different subjects, which enables the student to refer to the original observer of each given disease.

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A Practical Medical Dictionary

By Thomas L. Stedman, M. D. 12th Ed. William Wood and Company, Baltimore. 1933. Price, $7.50.

Anyone who is interested in the purification of medical orthography will enjoy using this dictionary. The author is known for his effort—extending over a period of many years—to insist on the use of the correct term in every instance. This dictionary is his supreme effort in that direction. The correct term is always given and special attention is paid to the etymology of words. In spelling, preference is given to the simpler forms. The diphthong is conspicuous by its absence. Chemical terms are graced with the final "e". To mention all of the fine features of this dictionary would entail the use of too much space—but its use will beget the conviction that it is a real medical dictionary in every sense of the word.

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A Textbook of Medicine

By 141 American authors. Edited by Russell L. Cecil, M. D., professor of clinical medicine, Cornell University, Medical College, and associate editor for Diseases of the Nervous System, Foster Kennedy, M. D., professor of neurology, Cornell University, Medical College. W. B. Saunders Company, Philadelphia. 1933. Price, $9.

A complete revision, with addition of much new material. As in previous editions, each disease, or group of diseases, is discussed by a writer particularly interested in that subject. Most of the 141 contributors are teachers of medicine in university medical colleges, and they have presented their material in a form especially acceptable to medical students.

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Histopathology of the Peripheral and Central Nervous Systems

By George B. Hassin, M. D., Professor of Neurology, University of Illinois College of Medicine. William Wood and Company, Baltimore, 1933. Price, $6.00.

Diseases of the spinal cord, brain and peripheral nerves are described individually from the histopathological angle only. Frequent, though brief, references to clinical aspects are made. Many bibliographic references are given. Important histologic technics are described. Several hundred illustrations amplify the text. The author's extensive experience in this field vouches for the excellence of the work. It is, of course, more suited for graduate than undergraduate study.

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A Synopsis of Surgery

By Ernest W. Hey Groves. 10th Ed. William Wood and Company, Baltimore. 1933. Price, $5.00.

This book is so well known that it is needless to enlarge on a review, except to point out that the revision appears to have been thorough. Sections on radium treatment of malignant disease, the surgery of the sympathetic nervous system and the vaseline pack method have been rewritten. A new chapter giving in brief outline the principles of amputations has been added. Other minor additions have been made.

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Disease of Infants and Children

By J. P. Crozer Griffiths, M. D. Emeritus Professor of Pediatrics in the University of Pennsylvania, and A. Graeme Mitchell, M. D., Rachford Professor of Pediatrics, College of Medicine, University of Cincinnati. 3d Ed. W. B. Saunders Company, Philadelphia. 1933. Price, $10.

Completely revised especially for the needs of the undergraduate. Nonessentials have been eliminated; text brought up-to-date. References at end of chapters are very valuable. Profusely but adequately illustrated. Method and style of presentation are most commendable and authoritative. Meets every need of the undergraduate.

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Diseases of the Chest and the Principal of Physical Diagnosis

By George William Norris, M. D., formerly professor of clinical medicine in the University of Pennsylvania, and Henry R. M. Landis, M. D., professor of clinical medicine in the University of Pennsylvania. 5th Ed. W. B. Saunders Company, Philadelphia. 1933. Price, $10.

A highly commendable feature of this book is the emphasis laid on the value of physical diagnosis over laboratory aids in the diagnosis of disease. The authors insist on a thorough comprehension of the laws of sound production and transmission to the end that results of percussion and auscultation can be interpreted intelligently. An entire chapter is devoted to the transmission of sounds through the chest. The endeavor is made to teach as much as possible by means of illustrations. They number nearly 500. Many of them are frozen sections from the cadaver made to preserve the anatomic relations of tissues as during life. A material aid to good teaching. This book should appeal strongly to the student in his endeavor to secure fundamental knowledge of the essentials in diagnosis of diseases of the chest.

Pediatrics

By Henry Dwight Chapin, M. D., Professor Emeritus of Peditatrics, New York Post Graduate Medical School, Columbia University, and Lawrence T. Royster, M. D., Professor of Pediatrics, University of Virginia. 7th Ed. William Wood and Company, Baltimore. 1933. Price, $7.

An extensive revision; many sections rewritten and much new material added. Normal growth and development are emphasized in keeping with modern trends in pediatrics.

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Manual of Embryology: Development of the Human Body

By J. Ernest Fraser, professor of Anatomy, University of London. William Wood & Company, New York. 1932. Price, $8.

It is the aim of this book to give the student a connected mental picture of the developing embryo. The regional method is used. No references are given, but, where a statement is made on the authority of some other worker, the name appears in brackets. Detailed observations are curtailed or suppressed. The free use of italic and blackfaced type makes quick reference an easy matter. Illustrations are numerous and excellent. A good text for the medical student.

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Surgical Pathology

By William Boyd, professor of Pathology in the University of Manitoba. Third edition. W. B. Saunders Company, Philadelphia. 1933. Price, $10.

Among new material are sections on metabolism of tumors, the goitrigenous action of cabbage, chronic follicular gastritis, developmental enterogenous cysts, autolytic peritonitis, high temperature deaths following cholecystectomy, obstruction of common bile duct, injuries to spleen, Cushing's syndrome, etc. Many sections have been either altered or rewritten. Pathology is placed before the reader wholly from a practical standpoint, thus being endowed with life and of prime value from the purely clinical standpoint.

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Principles and Practice of Obstetrics

By Joseph B. De Lee, professor of Obstetrics and Gynecology at the University of Chicago. Sixth edition. W. B. Saunders Company, Philadelphia. 1933. Price, $12.

This is a complete revision of previous editions, extending even to the illustrations. Much of the text is directed to the family doctor, the "obstetrician to the people," as the author dubs him, with the hope of raising childbirth to a higher plane in practice and to lower maternal and fetal mortality. Although the book is rather large, the student will find it a valuable addition to his library for every day use.

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Neuropathology: The Anatomical Foundation of Nervous Diseases

By Walter Freeman, professor of Neurology, George Washington University. W. B. Saunders Company, Philadelphia. 1933. Price, $4.

A presentation of present knowledge of the changes in diseases of the nervous system, enabling the pathologist to interpret what he finds on opening the cranial cavity or when examining prepared sections, and also so that the neurologist may visualize the disease processes that are evolving in his patients. Very well illustrated by numerous microphotographs. The glossary should prove helpful. A good book for the graduate student.

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Pictorial Midwifery

By Comyns Berkeley and Georges M. Dupinz. Second edition. William Wood & Company, New York. 1932. Price, $3.

A discussion of the anatomy, physiology and pathology of pregnancy, labor

and the puerperium by means of 257 illustrations and appropriate descriptions.

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Calcium Metabolism and Calcium Therapy

By Abraham Cantarow, instructor in Medicine, Jefferson Medical College. Second edition. Lea & Febiger, Philadelphia. 1933. Price, $2.50.

This book shows how to use calcium correctly and safely, making its employment sure instead of haphazard and dangerous. The dangers which result from a disturbance of calcium metabolism are indicated, as is the physiological basis for its employment and a recognition of both the value and the limitations of calcium therapy. All the facts are included, stated clearly and concisely.

"Life in all its complexities seems to be no more than one of the innumerable properties of the compounds of carbon."

Another key is found in the Introduction—Life as a Scientific Problem:

"A complete understanding, for which we are ultimately striving, can be obtained only of things which we can produce artificially. Since it is impossible to synthesize a real muscle we should at least try to approach such a synthesis as nearly as possible. In general we should study all artificial systems which bear even the remotest similarity to certain features of living organisms."

The book is a serious approach, however distant the goal, to the fascinating problems of the possibility of artificially producing life.

Following the Introduction the book is divided into sections as follows: (1) The First Attempt at Approach: Membranes, Osmosis and Related Forces. (2) The Second Attempt at Approach: Life Processes Related to Crystallization or Due to Surface Forces. (3) The Third Attempt at Approach: Electrical Currents in Tissues and Their Relation to Life Processes. (4) Outlook to Future Possibilities of Development.

Practical Obstetrics

By P. Brooke Bland, M. D., professor of obstetrics, Jefferson Medical College. F. A. Davis Company, Philadelphia. 1932. Price, $8.

This book will take its place between the large work and the small manual. The student will find it to be concise, but completely covering the field. Theory and practice share equally well. The newer concepts of obstetric physiology, the most recent views respecting the various phases of pregnancy, toxemia, and of puerperal infection are discussed fully. Symptoms are classified according to their general and local manifestations. Special points in differential diagnosis are tabulated. All types of treatment of accepted worth are discussed and special emphasis is placed on those methods which the author advocates and practices. The book is well illustrated with more than 525 engravings and colored plates. The references for additional reading are unique in contrast to the general custom as they are placed in a separate section. They are divided into two groups: those for general reading, such as standard texts, and those for reading on special topics. This second section corresponds to the respective chapters. There are about 500 such references. Students will appreciate this section. It has large teaching value.

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Habits: Their Making and Unmaking

By Knight Dunlap, professor of Experimental Psychology in Johns Hopkins University. Liveright, Inc., New York. 1932. Price, $3.

A good book for the advanced and graduate student.

The data and technic of the modern investigations of learning problems are presented by significant statements of relevant results. Illuminating to the psychologist is the account of the author's own contributions to the suppression and

cure of stuttering, stammering, tics, homosexuality and other undesirable habits. The new methods of therapeutic procedure described are of vital importance in the practice of personal and social readjustment. Of equal importance is this radical revision of the scientific point of view of the process of learning, extending over a range of the personal, vocational, social and cultural.

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Maternal Mortality and Morbidity

By J. M. Munro Kerr, M. D., Reguis Professor of Midwifery, University of Glasgow. William Wood & Company, Baltimore. 1933. Price, $8.25.

Assembled here is the information available on this important problem. It presents a general review of the conditions affecting puerperal mortality; material death rate; puerperal fever; influence of operative procedures, hemorrhages of pregnancy and labor and abortion on maternal mortality; maternal morbidity and subsequent disablement; neonatal death and disablement; antenatal and intranatal care; donirciliary and institutional service; organization of the antenatal clinic and the maternity hospital; midwife service; education of medical students in obstetrics and gynecology; a national maternity service.

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Combined Textbook of Obstetrics and Gynaecology

By J. M. Munro Kerr, J. Haig Ferguson, James Young and James Hendry, all of Glasgow and Edinburgh. 2d Ed. William Wood and Company, Baltimore. 1933. Price, $10.

The authors are of the opinion that a combined textbook on these two subjects will impress the medical student with the importance of a thorough knowledge of obstetrics and with the fact that the great majority of ailments encountered in gynecologic practice are the results of infections and injuries contracted during parturition—and saves repitition which cannot possibly be avoided when the two subjects are dealt with in separate manuals. This is a book of a thousand pages, and nearly 500 illustrations, with a special chapter on radiology in obstetrics and gynecology.

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The Differential Diagnosis of Endocrine Disorders

By Allen Winter Rowe, director of Research, Evans Memorial, Boston. The Williams & Wilkins Company, Baltimore. 1932. Price, $4.

The author boils down the experience of twenty years of collaborative effort of a large staff of clinicians and laboratory workers. The book is written in understandable terms and stresses the practical aspects of the subject. It is up-to-date, authoritative and comprehensive. Section I discusses the clinical considerations. Chapters V, VI and VII are especially valuable to the student. They discuss the primary and secondary complaints, the medical history and the physical examination. In Section II, laboratory measurements are discussed and in Section III, the special examinations which should be made. A very good and judicial survey of the literature is presented by way of a biblography. Students will find much in this book which will be of great help to them in the diagnosis and treatment of more or less obscure conditions as well as some clinical cases met in every day practice by the physician. Many moot cases are made clear.

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